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Value orientations and adoption behavior of Indian cultivators

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VALUE ORIENTATIONS AND ADOPTION BEHAVIOR OF INDIAN CULTIVATORS

by

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TABLE OF CONTENTS

INTRODUCTION

India is predominantly an agricultural and rural country. An overwhelming majority of her people live in the countryside. The village is the unit of the rural society. According to various estimates eighty to eighty-five per cent of India's population live in villages.

The growth of the village is bound up with the development of agriculture. The emergence of the village signified that man had passed from the nomadic mode of collective life to one of settlement. It was basically due to the improvement of the tools of agricultural production which made agriculture and hence settled life in a fixed territorial zone possible.

With the advancement of technology, man developed a stable agriculture, the basic source of assured food supply. In the agricultural phase, the struggle for existence became relatively less acute for man. Further at certain stages of the development of agricultural economy, due to the greater productivity of agriculture, a section of the community could be liberated from the necessity of participating in food production and could therefore concentrate on secondary industrial or ideological activity. This gave momentum to the growth of technology, art, science and philosophy. It also brought about, though slowly, the significant transition in the social organization of society, i.e., from gemeinschaft to gesellschaft; folk to urban. Civilization thus began with the development of agriculture.

Need for the Study

Agriculture is by far the most important industry in India and therefore occupies a strategic position in Indian economy. At present this important industry is effected by forces which are obstacles to its growth. Among these forces are, 1) over population, 2) physical isolation, 3) poor educational opportunity, 4) unsatisfactory tenure systems, 5) unsystematic credit systems, 6) ineffective implements and farming practices, 7) unsanitary conditions, 8) poor health, 9) low per capita income, and 10) adherence to out-moded customs, traditions and value systems.

A concentrated country-wide program in the form of community development, directed toward the introduction of scientific methods in traditional agriculture, is perhaps the most significant single development in agriculture during the past decade in India. The ultimate objective of this program is to raise food production for the Nation. One of the crucial aspects of India's planned development is her attempt to raise agricultural production through democratic means of extension education.

India, in her effort for planned development, gave primary importance to agriculture in the First Five Year Plan and the agricultural industry made progress during that period. The relatively lower priority given to agriculture in the Second Five Year Plan and limited progress in agricultural development emphasized the importance of agriculture in the National economy. In the Third Five Year Plan a greater allocation was made for the agricultural production which was more commensurate to

its importance.

The principle technical programs for increasing agricultural production are: 1) irrigation, 2) soil conservation, 3) dry farming and reclamation, 4) supply of fertilizers and manures, 5) seed multiiplication, 6) plant protection, and 7) better ploughs and other improved agricultural implements. In addition to the general programs mentioned above, 15 districts have been involved in an intensive program under a scheme commonly known as the "Package Program," with financial assistance from the Ford Foundation. Steps have also been taken by the National government as well as State governments to strengthen the organizations for program implementation in almost all the areas listed above.

Now, in spite of the action taken thus far, agricultural production in India has not increased to the extent envisaged in the Third Five Year Plan. This is evident from the fact that the increase in food production during 1961-62 over the year 1960-61 was only 1.6 per cent instead of the target of eight per cent.

Agriculture must be lifted from its present state of a depressed industry to a profitable business. As demonstrated in other countries, particularly in the United States of America, for such a change to occur the traditional methods of farming have to be replaced by tested scientific methods, e.g., recommended technology. Recommended technology is used here to mean scientifically derived methods and products which have resulted from research and through testing over a period of years, whose adoption will ensure optimum benefit to cultivators. The use of recommended technology in increasing productivity of agriculture is of great significance from the point of view of cultivators but is also

important in the larger interest of the country, whose economy depends primarily on agriculture.

The main obstacles in the way of greater acceptance of the technology available are:

1) The general apathy of a considerable part of the village population.
2) Suspicion and distrust of officials and outsiders.
3) Failure on the part of the extension project to evolve an effective adequate media of communication.
4) Traditional and cultural factors.

Experiences in the field of technological change and rural community development programs in many underdeveloped countries of the world have brought into sharp focus the importance of socio-psychological and cultural factors in a program of directed change.

This study is based upon the assumption that in addition to physical and economic factors, there are series of sociological and social psychological factors which condition the thinking and behavior of cultivators. The focus in this study is on the values and value orientations of cultivators. The study of value is an important area of investigation in relation to adoption behavior of cultivators. Within this area of value lies the cultural determinants that shape the cultivator's response to new and improved technology.

Objective of the Study

The objective of this study is not to make a complete survey of tradition and cultural factors of the community. Rather, it is to delineate, and describe the value orientations of cultivators that appear to be relevant to farmers' agricultural decision-making. The objective also involves the determination of the relationship between value orientation and adoption behavior of the cultivators. The following are the objectives explicitly stated out of the above statements:

1. Identify and measure general value orientation.
2. Identify and establish a hierarchical pattern of occupational value orientation.
3. Determine the degree of association between general value orientation and occupational value orientation, and each with the adoption behavior of cultivators.
4. Determine the degree to which general value orientations and occupational value orientations will predict adoption behavior.
5. Determine the degree to which personal and situational variables together with the general value orientations and occupational value orientations will predict adoption behavior.

This dissertation is divided into six major parts. The first part is concerned with the theoretical framework which forms the basis for the selection of variables and the derivation of hypotheses. The next part contains a discussion of the explication process by which empirical

hypotheses are derived, the procedures involved in measurement of the variables and the statistical tests used. The findings relevant to the hypotheses developed are presented in the third part. The fourth part of the dissertation contains additional findings. The discussion and suggestions for further research are given in the fifth part. A brief summary of the dissertation is given in the final part.

SETTING

The study was undertaken in the Community Development Block Khanjawala in the Union Territory of Delhi. The Union Territory of Delhi is spread over an area of 593 square miles with a total population of 3 million people. Approximately ten per cent of the population live in the rural areas. The rural sector is comprised of 300 villages. The entire rural area is included in five Community Development Blocks with headquarters at Nangloi, Nazafgarh, Alipur, Mehruli and Sahadra. Khanjawala Block, in which the field investigation was conducted, has its headquarters at Nangloi. In addition to usual Community Development Block organization, the Intensive Cultivation Scheme of the Division of Agricultural Extension of Indian Agricultural Research Institute also is operative in this Block. The main function of this scheme is to serve as a two-way channel of communication between the research workers in the diverse fields at the Indian Agricultural Research Institute and the cultivators. This involves the dissemination of the results of research among the farming community as well as bringing the problems of these cultivators to the attention of the specialists or research workers.

The Khanjawala Block (Figure 1) is bounded by the Community Development Block Alipur to the north and by Nazafgarh to the south. The city of Delhi lies toward the east while the district of Rohtak, in the Punjab, forms the western boundary. The Block is predominantly rural and consists of 56 villages, an area of 68,000 acres, and has a population of about 60,065 people.

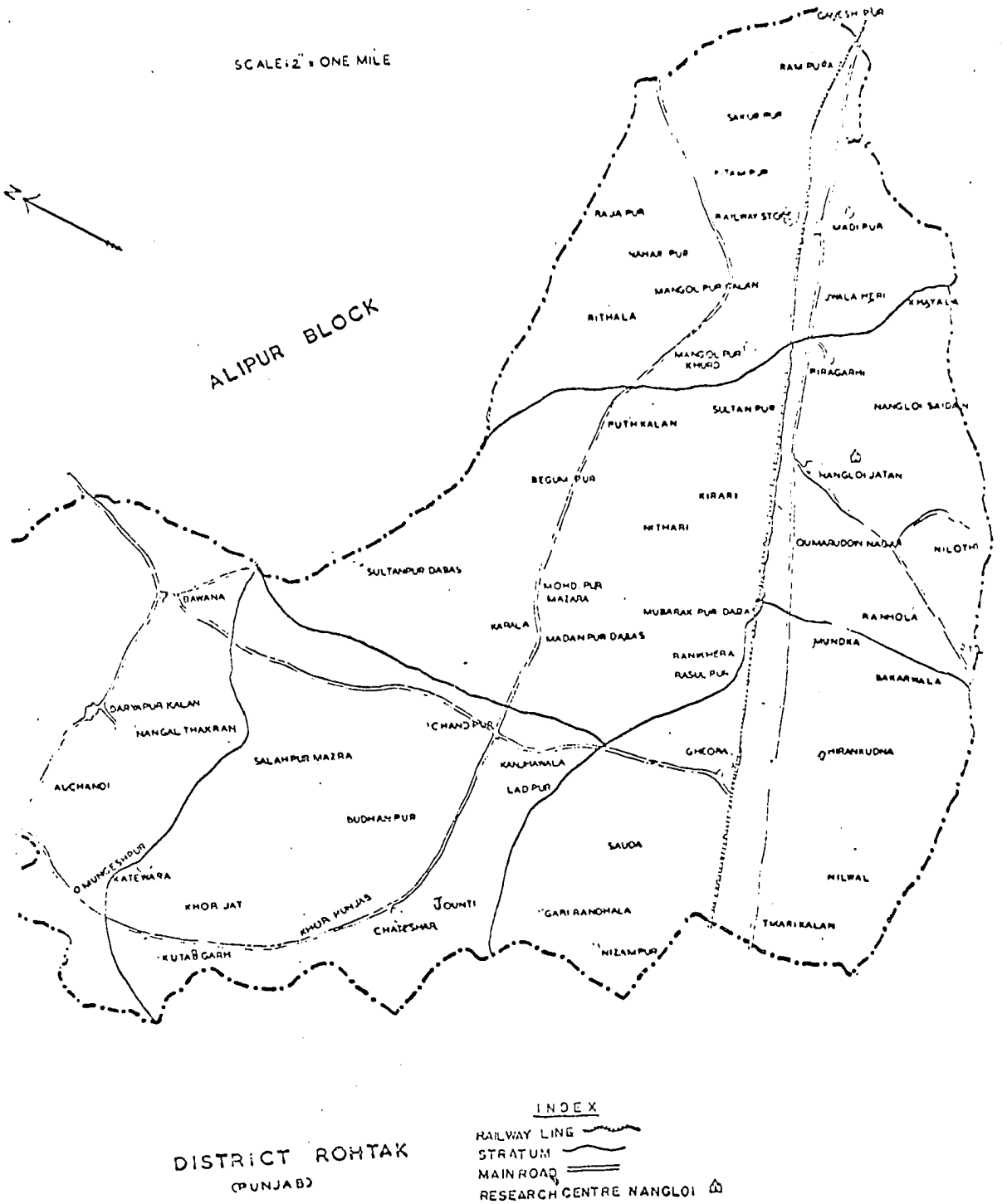

Figure 1. Khanjawala Block

Population Characteristics

Occupational groupings

In most of the 56 villages of the Khanjawala Block there are several major castes. Each caste group has its own main occupation. In most cases there is also a subsidiary occupation.

Caste	Ideal caste occupation	Occupation actually followed	
		Main	Subsidiary
Jat	Administrator, fighter	Farming	
Brahmin	Priestly duties	Same as caste	Agriculture, farming
Chamar	Skinning and leather work	Laborer	Skinning
Bhangi	Sweeping	Same as caste	Laborer
Kumhar	Making clay pots	Same as caste	Laborer
Jhivar	Water carrier	Same as caste	Laborer
Dhobi	Washer man	Same as caste	Laborer
Khati	Carpenter	Same as caste	Laborer
Lohar	Blacksmith	Same as caste	Laborer
Nai	Barber	Same as caste	Laborer
Chipi	Laborer	Same as caste	Laborer
Baniya	Merchant	Farming	Merchant

The farm families in all the villages belong mainly to the Jat or Brahmin caste. All castes are occupationally dependent of each other. Each caste group within a village is expected to give certain standardized services to the families of other castes. For example, a Khati (carpenter) repairs tools, a Nai (barber) cuts hair; but they do not necessarily perform these services for everyone. Each man works for a particular

family or group of families with which his family has traditionally served. The family or family head served by an individual is known as his jajman while the man who performs the service is known as the jajman's kamin. The whole system is popularly known as the jajmani system. The main characteristic of the system is that it operates without much exchange of money. The jajman compensates his kamins for their work through periodic payments mostly in grain. Kamins may also receive benefits such as free food, clothing, a residence site, use of certain tools, raw materials, etc. The major function of the system is to assure a stable labor supply for the dominant agricultural caste.

The above is the general pattern. There is however a trend toward a breakdown in this pattern which is directly related to the breakdown of the caste system. The adoption of non-caste occupations is now becoming evident in this area and can be considered as an indication of the breakdown.

Level of living

There is no standard scale by which to measure and indicate the level of living of the people. The level of living in most of the villages in India is presently low. Most of the people are in debt, live under unsanitary conditions, are undernourished because of inadequate diet and are very susceptible to disease as a result of a combination of these and other factors.

The people eat wheat and corn and are predominantly vegetarian in their eating habits. Jats and members of certain lower castes occasionally eat meat. A limited variety of green vegetables are consumed by

either vegetarian or non-vegetarian groups. The chief sources of protein are from pulses, lentiles, split peas, milk and milk products all of which form part of the diet. Consumption of milk and milk products is not common among the lower castes for economic reasons.

Clothing, except for the economically better off Jats and Brahmins, is not adequate to meet the extreme changes in temperature during winter.

The houses of the Jat, the dominant caste, are clustered together for the most part in the center of the village. Some of the Brahmins are situated in the center among the Jat families. Most of the other castes are located in the outskirts. Five types of houses are distinguishable according to their functions:

1. Baithak - a house or a room used by men only, for social purposes and for sleeping.
2. Ghar - a house in which the women of a family live.
3. Ghar-Bagar - a house in which cattle are also kept.
4. Bager - a shed in which only animals are kept.
5. Combination - a house in which baithak ghar, and Bagar are grouped in a single unit.

The village houses may be classified into three types according to materials used in their construction:

1. Kaccha - a house made of unbaked mud brick.
2. Pakka - a house made of fired brick.
3. Kaccha-Pakka - a house made of both types of brick.

Most of the pakka houses have been built by the Jats, while the lower castes tend to live in one-room mud houses.

Social structure

Local village government The village panchayat or council of five was set up according to the Panchayat Raj Act. The membership of this local village government is on the basis of adult franchise. The village panchayat is formed in every village with a population of 250 or over. The function of the village panchayat is to plan programs for village development and consider taxations, plan for educational communications and other services, forward applications for concessions, loans, etc. Four to five village panchayats elect from among their respective members, three persons to join adalti panchayat (a judicial body). The maximum membership in this judicial body is approximately 35. The purpose of the adalti panchayat is primarily judicial, settling of disputes, levying fines, dealing with local breaches of law and order to a certain degree. There are cooperative societies in most of these villages. People of the villages can become members of the society by buying shares in them. There are sharp variations in cooperative society membership with regard to caste and economic class. The memberships in the cooperative societies are mostly in the hands of the Jat group, the chief landowning group.

Education Education is not uniformly distributed. There are sharp variations in school attendance with regard to sex, age, and caste. While 70 per cent of the boys of school age go to school, only 23 per cent of the girls attend school (46). The highest educational level offered in this area is equivalent to a higher secondary school (grade twelve). There are primary schools in most villages.

Kinship group There are three types of organized units of kinship which may be noted:

1. The family (nuclear or joint)
2. The local group of relatives; popularly known as Kunba.
3. The wider group of relatives known as Khandan.

In the villages of this region it is common to find a house shared by a number of people having close lineal ties. However, they do not live as one large joint family; they live as distinct nuclear families organized as separate chullas (hearths). While these families are nuclear families, the fact that they share the same house with other kin and are governed by structured patterns of behavior within the kin group give them a special character, and they appear to be an intermediary type between the ideal type nuclear and joint families. Joint families are not uncommon, but large joint families comprising all lineally related males of two or three generations and their wives and children are rare. Where joint families occur they result from the fusion of two or three nuclear families. Fusion of more than three generations is called kunba. All kunba having recognizable lineal relationships with one another constitute the khandan.

Solidarity existing between such clusters of lineally related families expresses itself on ceremonial occasions and in times of stress and calamity. In the hour of need they are expected to support one another, and mutual consultations among them in regard to all major decisions are regarded as desirable. Informally they function as an effective agency of social control. The outlook of these people is distinctly kin oriented.

A word may be added about the type of regional exogamy that is practiced in these parts. In brief the practice follows this pattern: the people of one area will seek mates for their girls in another area. Thus a person in region A will give their daughters in marriage to residents of region B and will seek brides for their sons from region C. The boundaries of these exogamous regions have been defined by long tradition.

Religion The area is predominantly Hindu and basic Hindu concepts such as Karma, Dharma and Maya greatly influence the life and thinking of the people. Live is to be accepted and there is nothing that can be done to appreciably improve one's lot since what one is--socially, economically and in other aspects--is the result of the good or bad deeds of one's previous life. There is a belief in the transmigration of souls, therefore, persistent ill deeds of today may cause one to be born in a lower form of life in the next life. Ritual is an important part of the religion.

Value systems

The more important value orientations or value positions are embodied in the following prestige giving factors:

1. Caste of the individual - High prestige goes along with high caste and position in the caste hierarchy. This is still an important factor although it is definitely becoming less important. Thus Jats and Brahmins, though respected and given due preference, are not necessarily the most influential group at present. In certain instances they have to adjust to the will of other caste

groups.

2. Age - This also operates within the caste as above. The older the age, the greater the prestige.
3. Possession of land and type of tenure - Ownership of land brings with it definite prestige which increases with the amount of land owned.
4. Educational level - Prestige is given for educational level. A person who can read and write has a higher social standing than one who is illiterate, other factors such as caste, and age, held constant. The value of education above the high school level is questioned by most villagers.
5. Hard work - A hard working man who does his duties and faithfully fulfills his obligations is accorded prestige. Laziness is a de-statuing factor.
6. Ability to work as opinion giver: Contact with government officials - These attributes give social prestige. When higher level of education results in this, education becomes a strong prestige giving factor. Coupled with this might be mentioned another prestige giving factor, viz., knowledge of the "outside world."
7. Personal characteristics - Truthfulness, honesty, hospitality, reliability: these are considered important social values that build personal integrity and give prestige. In fact, it is difficult for any person to achieve a high status in the village unless he possesses at least some of the above

personal qualities.

8. Religious orientation - Here the emphasis is not on rituals, although these are considered important, but belief in something larger than self; a belief in man's utter dependence on God; a belief that it is God who controls men's ultimate destiny and all things are in his hands. This, together with the personal qualities mentioned above appear to give prestige.

Agriculture and livestock

Land in this area may be divided into three classes: a) farming area, b) residential area, and c) area in ponds and groves. All arable land is under cultivation. The breakdown of the area classified above is roughly as follows:

Arable land - 85 per cent

Residential land - 10 per cent

Groves and ponds - 5 per cent.

There are two crop seasons in the agricultural year. The first, Savani, is the autumn or Kharif crop, which is dependent upon the monsoon rains. The second, Sarhi, is the dry-season or rabi crop, which is dependent upon irrigation. The agricultural cycle for this area is as follows:

Mid-June to mid-July----------kharif sowing

August through September----------tillage for rabi

Early October to early November-----Kharif harvest, rabi sowing

December to mid-February----------Weeding and irrigation of rabi

March to mid-April----------Rabi harvest

Mid-April to mid-May----------Threshing and sale of rabi

Mid-May to mid-June----------Culture of cane in original land.

Sugar cane is the chief cash crop grown during the first crop season. The chief staple crop of the second crop season is wheat. The agricultural tools and equipment, by and large, are old and hand or bullock operated. There are a few tractors which are owned by large-sized land owners (35 acres and above).

Cattle are particularly important in the agricultural economy. Buffaloes are valued more than cows in this region. Buffaloes will give 12 to 20 pounds of milk daily for eight months, while a cow will yield 6 to 10 pounds daily for five or six months. Apart from their value as draft animals and producers of milk, butter and ghi (oil of butter), cattle are of crucial significance in the village because of their dung. The dung is used for two purposes; as fertilizer in the fields and as fuel.

The villages and people of this area have been very briefly described with the specific purpose in view--to describe the existing physical and social setting within which the value orientations and adoption behavior will be scientifically examined in this dissertation.

REVIEW OF LITERATURE

A thorough review of literature is essential to any research endeavor. The main functions of the review of literature are to: determine what work, both theoretical and empirical, which has been done before; assist in the delineation of the problem area; provide a basis for the theoretical framework; provide insight into methods and procedures; suggest operational definitions of major concepts; and, provide a basis for interpretation of the findings.

There is general lack of literature directly relevant to the problem under study. Therefore it is judged that a separate review of literature would not be very meaningful. Rather, the review of literature has been integrated into the relevant parts of the dissertation. This has been done for another important reason. The various functions that review of literature performs are related to each section. Relevant literature must be reviewed as the conceptual framework is developed, as the methods and procedures are explained, and as the findings are interpreted. It is hoped that the review of literature, used in this manner, will contribute to a more meaningful overall presentation.

THEORETICAL ORIENTATION AND DERIVATION OF HYPOTHESES

The objective of this chapter is to discuss the theoretical orientation of this study. The study deals with the relationship between value orientation, the independent variable, and adoption behavior, the dependent variable. The theoretical orientation is divided into three parts:

1. The taxonomical aspect of theoretical orientation, involving discussion on the three general level concepts: value, value orientation and behavior. A brief discussion on situational and personal variables will also be incorporated.
2. The main postulate or assumption of the theoretical orientation, including a discussion of general theory and the selection of relevant variables for the study.
3. The derivation of general and sub-hypotheses.

Taxonomical Aspect

Value and value orientation

Introduction It is a characteristic of many disciplines that their members are not always able to agree on the nature and origin of the phenomena they examine. This lack of agreement is specifically reflected in the formulations and abstractions, including origin and definition, of the concepts. Among social scientists who focus their study on "value and value orientation" the concepts have attained such a degree of heterogeneity that it is difficult to determine whether any of the resulting definitions, or even any one group of definitions, is

adequate. Therefore, it is obviously difficult to present all the ways the concepts have been defined and used, and the degree of concensus. However, an attempt will be made to give a relatively detailed discussion of the concepts. An attempt will also be made to differentiate the concepts of value and value orientation from related concepts.

Value as normative vs. existential Values may be conveniently viewed in the perspective of being normative or existential. As McKeon (52) has pointed out these two are not opposed to each other, and he further states:

> In the context of cultural expressions, ideas and ideals are not opposed to facts... In that factual context the preferable and the possible are determined by what men want or think they want and by the social order which they plan or dream as means to attain it... (52, p. 202)

It has been said that value in a normative framework cannot be studied empirically. The reasoning behind this assertion is that empirical inquiry is limited to existential propositions concerning means-end relationships, and that ends themselves cannot be chosen on empirical grounds and therefore cannot be the object of scientific inquiry. Scott (75) while agreeing that values (normative) themselves are in principle not subject to evaluation, argues that one may examine the human process of evaluation in arriving at ultimate values against which means are assessed.

Values and other related concepts In a psychological frame of reference, confusion about the concept of value may arise when it is considered as the nexus of all relationships between persons, groups or objects. Another source of confusion about values is their relationship to and differences from such other enduring dispositions as

attitudes, interests, sentiments and beliefs. The concept of value is, therefore, blurred to some extent due to its perceived close relationship to these other related concepts. Kilby pointed out:

> The fact is that all are of the same general class, being enduring dispositions, and share common features, and overlap each other. Effort at sharp differentiation is pointless. The question is whether there is enough behavioral difference to warrent the separate categories. A value is motivational, as are the others, sometimes involves interest or sentiment and often has the for-or-against quality of an attitude. Whereas attitudes usually involve specificity, there are some guiding behavioral dispositions within individuals which cannot properly be covered by any of the terms like attitude or others and may conveniently be called values. (42, p. 190)

Berelson and Steiner (6) state that great deal of attention is given to the differentiation of values and other related concepts in behavioral science. To them, terms such as value, opinion, attitude and belief do not have fixed meanings in the literature, but in general are used to refer to a person's preference for one or another side of a point of view. In this connection they further stated:

> They differ from one another in their generality or in the intensity with which they are held. Opinions commonly refer to topical and short-run judgements, usually dealing with questions of public affairs; attitudes are somewhat more enduring and inclusive; beliefs are more basic still, having to do with the central values of life. (6, p. 558)

Value, therefore, becomes a core of all these concepts around which other related concepts are formed and developed. There are no hard and fast boundaries for these terms.

Values as criteria Catton (15) and Williams (94) both note that values are not the goals but rather are criteria by which goals are chosen and individual preferences are ordered.

This approach to value is also evident in Kluckhohn and others. For example:

> A value is a conception, explicit or implicit, distinctive of an individual or characteristic of a group, of the desirable which influences the selection from available modes, means, and ends of action. (43, p. 395)

In the above definition, they emphasized the affective (desirable), cognitive (conception) and evaluative (selection) components as essential elements in the concept of value.

Values as goals Values may be considered as goals, which implies that instead of saying that a goal has a value, in this usage a goal is a value. Here the value system includes the prescribed goals toward which people should strive. These goals vary from very specific to very general. Some values, in this sense, are obligatory, some are preferred, some permissible and some are taboo.

Values as hierarchial structures No one can pursue all values at the same time with the same degree of preference. The individual is forced to make a choice between the goals and means that he values. This notion leads to the important characteristic of the hierarchial structures of values; some are more preferred than others; some are more permissible than others; some are more dominant than others and so on.

Values as systems Nelson (57) points out that value systems are the organizations of, or interrelationships among, a code of conduct, including means and goals. Value systems, may be seen as including four essential aspects: 1) prescribed goals toward which people should strive, 2) prescribed means of achieving these goals, 3) sanctions enforcing conformity, and 4) organization of these prescriptions so that

there is no contradiction or conflict among them. In practice contradictions or conflicts do occur as the interrelationship between goals and means is often unclear and sometimes contradictory.

Value orientations Values do not operate singly. Numerous values and their interaction form a system in which the individual or group finds his position. Williams (94) has observed:

> Values and systems of belief do not operate as single and separate units but are in continually shifting and recombining configurations marked by very complex interpenetration, conflict, and reformulation. (94, p. 440)

In elaborating the concept of value orientation, Parsons and Shils have observed:

> Value orientation refers to those aspects of the actor's orientation which commit him to the observance of certain norms, standards, criteria of selection, whenever he is in a contingent situation which allows (and requires) him to make a choice. (63, p. 59)

Valuing is not in terms of absolute quantum; that is to say, the preferences are not based on discrete units in an "all" or "none" fashion. Individual may prefer a particular value among alternatives; but even in that particular value, he may have degree of preference which he values most. Thus values can be thought of as dimensions, each involving a continuum on which the individual locates himself at suitable points. These points establish his value orientation.

Some conclusions regarding values and value orientation

On the basis of the above discussion, it can be seen that the concept of value has been considered at two levels: General and specific. At the general level, value is an abstract latent normative standard

which is a product of the interaction between subject and object and represents an individual's concept of what men ought to desire and what relationships ought to exist between the phenomena. At the specific level, value is regarded as a criterion applied by a person to assess the goodness of an object.

The following sections will discuss the formulations of these concepts in more detail.

Behavior

The behavior of an individual is a composite of goals or ends he selects and the means that he chooses to pursue to reach those ends. Behavior, therefore, has been conceptualized within an action frame of reference. This mode of thought stems from Weber's theory of action. Weber states:

> In 'action' is included all human behavior when and in so far as the acting individual attaches a subjective meaning to it. Action in this sense may be either overt or purely inward or subjective; it may consist of positive intervention in a situation, or of deliberately refraining from such intervention or passively acquiescing in a situation. Action is social in so far as, by virtue of the subjective meaning attached to it by the acting individual (or individuals), it takes account of the behavior of others and is thereby oriented in its course. (90, p. 88)

Within this framework, action in this sense may be either overt or purely inward or covert.

Parsons and Shils (63) stated that any behavior of living organism might be called action; but to be so called, it must be analyzed in terms of the anticipated state of affairs toward which it is directed.

In order to discuss the above notion, it is necessary to move to a common denominator of human behavior such as that suggested by Bohlen

and Beal (8), the unit act. According to them, the unit act consists of: 1) the receipt of a stimulus, 2) the interpretation of this stimulus, and the circumstances under which it was received, and 3) a response or an action.

In light of the above notion, the term behavior (response) is explicated in this dissertation to the lower level of adoption behavior. The term adoption has been applied to acceptance and use of improved practices or products. Ramsey and other (66) conceived of adoption in two parts, namely: Cognitive adoption and behavioral adoption. The following conceptualization attempts to integrate these ideas: 1) cognitive adoption (in Weber's terms) involving complex decisions and changes, including obtaining knowledge, critically evaluating practices in terms of the individual situation (interpretation of stimulus in given circumstances (Bohlen and Beal's terms) and 2) behavioral adoption (overt in Weber's terms) involving an actual use of the practices (action or response: Bohlen and Beal's terms).

In this dissertation adoption behavior has been conceptualized as behavioral adoption. From a methodological point of view the concept of behavioral adoption provides evidence in terms of adoption behavior and the evidence can be measured more scientifically, objectively, and empirically. The trial stage can be included in behavioral adoption. For the present study, the behavioral adoption is defined as actually trying or using a practice on a continuing basis. The operational definition and measures of adoption behavior will be developed in the methodology chapter.

Situational and personal variables

An important element in any theory of human action is the situation or the circumstances under which the individual receives a stimulus. This element is recognized by Parsons and Shils (63) and they state that behavior of any living organism is called action only when it is analyzed in terms of a situation in which it occurs.

The importance of the situation was earlier recognized by Thomas (81). He viewed the social situation as consisting of three interrelated elements: the objective conditions, which include the socially enforced rules of behavior, the pre-existing attitudes and values of the individual and the group; and the definition of the situation by the actors themselves.

Kluckhohn (44) and Newcomb (58) suggest that one cannot expect a perfect correspondence between value, belief and behavior because behavior is a function not only of value orientations but immediate situations as well. Newcomb further added that human behavior is a function of the interaction of three variables: experience, current attitude and values, and the current situation.

Bohlen and Beal (8) while discussing their concept the unit act have emphasized the importance of the circumstance under which the stimulus is received and interpreted by an actor before he responds to it.

On the basis of the above interpretations, it would be expected that the relationship between values and behavior can be more completely understood if one has knowledge of certain situational and personal variables which comprise the constructed world of reality within which

an individual receives the stimuli and acts. Some selected situational and personal variables will be examined to determine if they have any impact upon the relationship between value orientations and adoption behavior. Situational variables used in this study are land size, irrigation, and family size. Personal variables are education and membership in local organizations. However it may be pointed out that this dissertation is not directly concerned with these variables. A special section of this dissertation will be devoted to reporting the analysis of these variables.

Theoretical Orientation

Assumption

The main assumption of this theoretical orientation is that an individual is a social product; his motivating values and behavior are mainly determined by the basic values of social systems of which the individual has been or is a member. The social systems could be sub-systems or groups. Anthropologists regard values of people as indispensable to the interpretation of concrete behavior. The basic values have been termed configuration (Kluckhohn and Strodtbeck, 44), cultural theme (Opler, 60), and core culture (Thompson, 82). Basic personality type (Kardinar and Linton, 39) is a concept similar to those just presented above. The basic values of given social systems provide the very symbols and concepts with which an individual thinks. Men do not think in a vacuum; their past experiences help them to develop reason within a given framework of the basic values. Basic values are rarely questioned, because they are the only realities (sui-generis: Durkheim,

26) one knows. They are retained until shattered by powerful conflicting experiences. The basic values are systematically instilled through socialization and compelling rewards and punishments to ensure that an individual internalizes them. These internalized values become the directing or motivating forces in an individual. An individual desires to behave in the direction pointed out to him by his internalized values. There is uniformity of behavior due to the basic values. Certain deviations from the basic values are permissible without punishment by the system. These deviations are the function of different degrees of socially acceptable interests, ends, and means allowed by the system. Though the individual values remain compatible with the basic values of the system, they may vary in different ways in terms of type and levels and with varying degrees of emphasis (hierarchy) which accounts for the individual's value orientation. These varying degrees of emphasis on basic values, which determine the individual's value orientation, result in variation in the behavior of individuals. In other words, variation in behavior is partly a function of individual value orientations and partly a function of situations.

The following figure, similar to one presented by Newcomb, Turner, and Converse (58), is presented to explain the above assumption.

In the following sections only one aspect of Figure 2, e.g., behavior as a function of individual's value orientations will be discussed. The term value orientation has been further conceptualized in terms of types of value orientations and levels of value orientations.

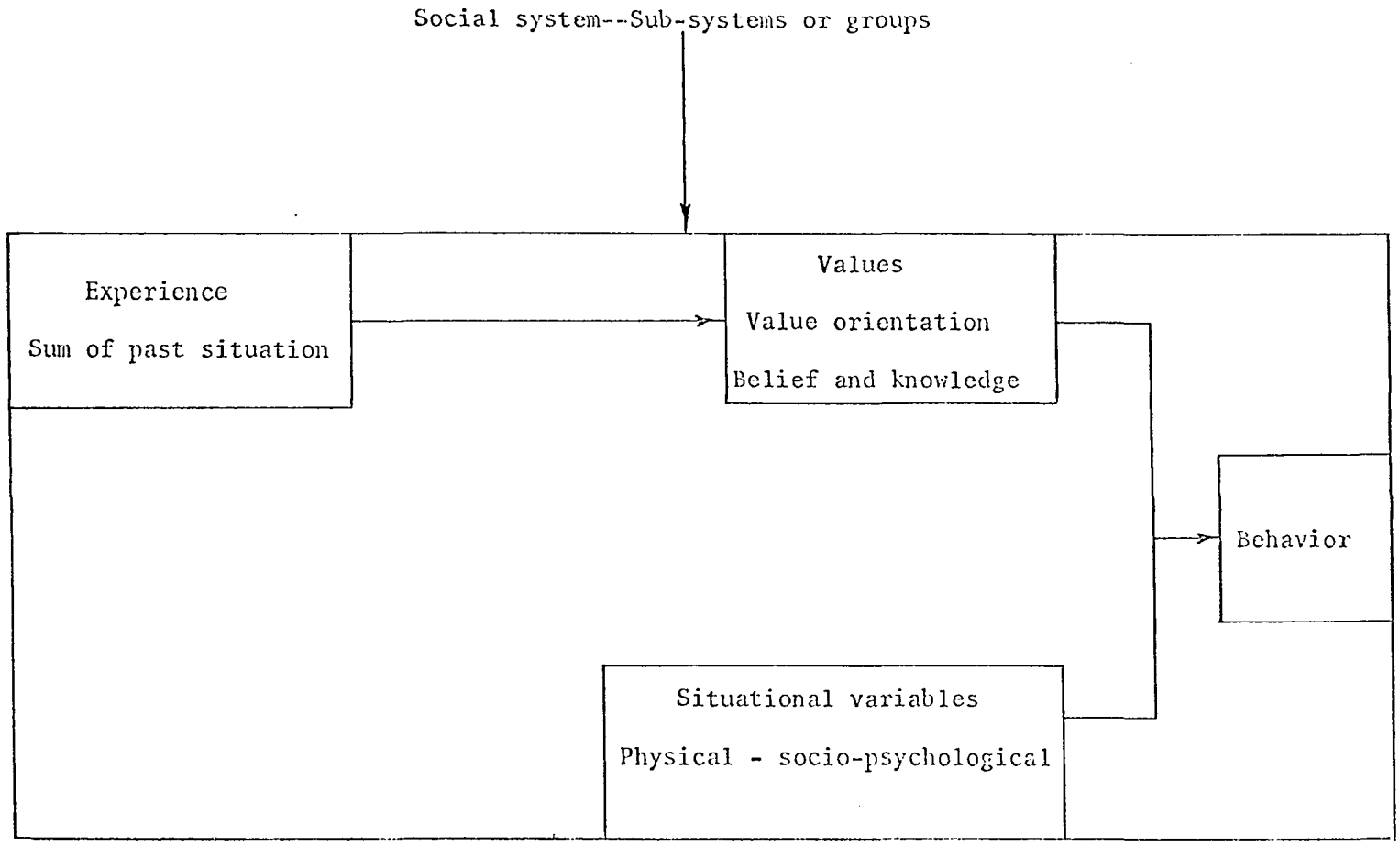

Figure 2. Social systems - sub-systems or groups

Types of value orientation

The discussion here will begin by considering some dichotomous classifications of types of value orientations which are considered to be relevant to this study.

Gemeinschaft-gesellschaft Tonnies (84) approached the area of social relationship by way of these two concepts. All the facts of society and social relationship are viewed by him as products of human will. All interaction is based on acts of will. He further differentiated between natural wills and rational wills. In natural wills people may associate, because relationship is valuable to them. Here the relation is an end in itself. Conversely rational wills, people may associate in hope of achieving some additional end--association is a means to an end. Tonnies categorized relationships based on natural wills as Gemeinschaft and those relationships based on rational wills as Gesellschaft.

Mechanical - organic solidarity Comparing the primitive and civilized society, Durkheim (26) found the former to be characterized by mechanical solidarity and the latter by organic solidarity. Mechanical solidarity is rooted in similarity of individual members of a society. Here division of labor is rudimentary, individuals are relatively similar and are bound together by a mechanical solidarity. Organic solidarity emerges with the growth of the division of labor and consequently dissimilarities. It brings about increasing specialization and individualism.

Traditional - rational Discussing his mode of orientation of social action, Weber (90) developed his typology of social action by using

the concepts ends and means. Action is classified into four types.

1. Rational - a situation with plurality of means and ends in which the actor is free to choose his means and ends purely in terms of efficiency.
2. Evaluative - a situation with a plurality of means and ends in which the actor chooses means for their efficiency but the ends are fixed in advance.
3. Affective - a situation with a plurality of means and ends in which the actor is guided by his emotions in determining means and ends.
4. Traditional - a situation in which both ends and means are fixed by the custom and the individual is a passive recipient.

Folk - urban The folk society is the small collectivity, containing only people who know each other well. It is homogeneous, nonliterate, and has a strong sense of solidarity. There is little division of labor. Kinship and institutions are the key to this system. The urban society is the antithesis of it.

This type of Redfield's (68) folk is similar to Gemienschaft of Tonnies and mechanical solidarity of Durkheim.

Primary group For Cooley (18) the most important groups in the formation of individual human nature and development of norms and ends are primary groups. Such groups are primary as they are fundamental in forming the social nature and ideals of individuals.

Sacred - secular For Becker (5) the sacred society is isolated socially and mentally. Social controls are primary and there is little

division of labor. Kinship ties are strong. Non-rational behavior is predominant. The secular society is at the opposite end of the continuum and is socially and mentally assessable. Rationality is dominant. Redfield's dichotomy folk and urban appear to be similar to what Becker calls sacred and secular.

The classifications given above do resemble each other in important ways. In all, the group dominates the individual (social mold theory of Durkheim, 26). There are some important differences, but the essential similarities of these classifications are great. The purpose here is not to discuss the similarities and differences. Although these terms have been commonly used to refer to and describe varying types of social systems or social relationships, they are used here to polarize the two types of value orientations. Hereafter the two types will be referred to in terms of Redfield's classification:

Folk: representing gemeinschaft, mechanical, traditional, primary and sacred.

Urban: representing gesellschaft, organic, rational, secondary and secular.

These two types of value orientations, folk and urban, are ideal types not existant in the real world. Therefore an individual may possess elements of both.

After this brief discussion of the above dichotomous classifications and the purpose for which they are discussed, the distinguishing features of each ideal type will be summarized for two reasons:

1. To highlight the most important and common characteristics of each.

2. To provide a basis for selecting relevant variables for developing hypotheses regarding expected behavior.

Table 1 presents a summary of some important distinguishing features of the above dichotomies.

Table 1. Summary of some distinguishing features of dichotomous classification types of value orientation

Gemeinschaft	Gesellschaft
Mechanical	Organic
Traditional	Rational
Folk	Urban
Primary	Secondary
Sacred	Secular
Illiteracy	Education
Lack of material comfort	Material comfort (leisure)
Uncritical acceptance of decision arrived by friends, relatives (external conformity)	Self-reliant and individual responsibility for decision taken (individualism)
Superstition (fatalism)	Belief in science (scienticism)
Feeling of uncertainty regarding nature, such as natural hazards	Feeling of certainty and protection against risk (security)
Uncritical acceptance of precedent (traditionalism)	Rationality in every course of action
Folk ways and Mores rule: rigidity (authoritarian approach)	Rational decisions are taken; individual freedom to make choice (non-authoritarianism and freedom)
Contacts are primary (localite)	Contacts are secondary (cosmopolite)
Traditions play an important role (conservatism)	Traditions play no role (liberalism)
Value on kinship: extended large family and kinship ties (familism)	Nuclear family, non kinship ties
Value placed on manual labor (hard work)	Value placed on use of labor saving devices to attain economic ends (economic)

The summary given in Table 1 is not intended to be exhaustive. The purpose was to highlight some distinguishing features which are common in all the dichotomous classifications discussed and then to point out the important aspects of value orientation involved. The value orientations indicated in the parentheses are believed to be logically related to the concepts under which they are stated. These relationships and the rationale for placing them in their respective positions in the folk - urban dichotomy will be developed more in detail in the following section.

The focus of discussion will now be concentrated on the level of value orientation.

Level of value orientation

Various attempts have been made to elaborate the concept of value orientation by classifying values. Values have been classified as essential and operational values. Another classification of values is intrinsic, extrinsic, inherent and instrumental. Values are classified as asserted and operating values. Values have been discriminated also according to nature of interest: positive - negative, progressive - recurrent, potential - actual and so on. According to content, values have been classified as hedonic, aesthetic, religious, economic, ethical, and logical. The Allport-Vernon study (3) of values classified values as theoretical, economic, aesthetic, social, political, and religious with special reference to Western culture.

For this study the classification given by Kluckhohn and others (43) was found more appropriate because of its relevancy to foreign culture.

They state, "It is convenient to use the term 'value orientation' for those value notions which are (a) general, (b) organized, and (c) include definitely existential judgements." Kluckhohn further suggests values and value orientations may be classified according to dimension of generality--some value orientations are general and some are specific to certain situations or to certain content areas.

Implicit in the above statement is the idea that there are two levels of value orientation, general and specific. These two levels of value orientation will now be examined in more detail. The former will be referred to as general value orientation. Occupational value orientation will be used as a relevant instance of specific value orientation. Occupational value orientation pertains to a specific situation, i.e., farming as an occupation. The specific value orientation then by definition is an organized set of values which apply to a specific content area. This set of values is relatively preferred and emphasized, thus consistant with the concept of value orientation. The general value orientation then by definition is an organized set of values which is extensive and affects almost every area of one's life. This set of values is also relatively preferred and emphasized. In both cases, the directive or motivational aspect is of primary interest.

General value orientation The theoretical approach to general value orientation is based on the assumption suggested by Kluckhohn and Strodtbeck (44) which can be summarized as follows. In the perspective of all people in all societies at all times, there is a limited number of common human problems for which alternatives of solutions are presented but differentially preferred. The variability of possible solutions is

within a definite range. Kluckhohn and Strodtbeck singled out five problems crucially common to all human groups: 1) human nature orientation dealing with character of innate human nature, 2) man-nature orientation dealing with relation of man with nature, 3) time orientation dealing with temporal focus of human life, 4) activity orientation dealing with the modality of human activity, and 5) relational orientation dealing with modality of man's relationship to other men.

In the study of value orientation many dimensions of values could be considered. To choose a few values, or for that matter, value orientations out of a multitude is a difficult task. Human nature orientation deals mainly with ethical values. Therefore this value orientation was not considered important with reference to this study. From the other four, five dimensions of value orientations were chosen. The five dimensions are treated as continuua, each continuum is also considered as a variable. The five dimensions (continuum or variables) are: conservatism - liberalism, fatalism - scienticism, authoritarianism - non-authoritarianism, localite - cosmopolite, and external conformity - individualism.

The following figure is used to represent the above notion.

Conservatism - liberalism The terms, conservatism, liberalism and related terms like dissenters, agitators, free thinkers, infidels, rebels, and reformers are found very much used in every day parlance. These terms are defined in different ways. Conservatism tends to be associated with: 1) preference ofpast, 2) dislike for social change, 3) holding vested interest, 4) preserving the status quo of existing

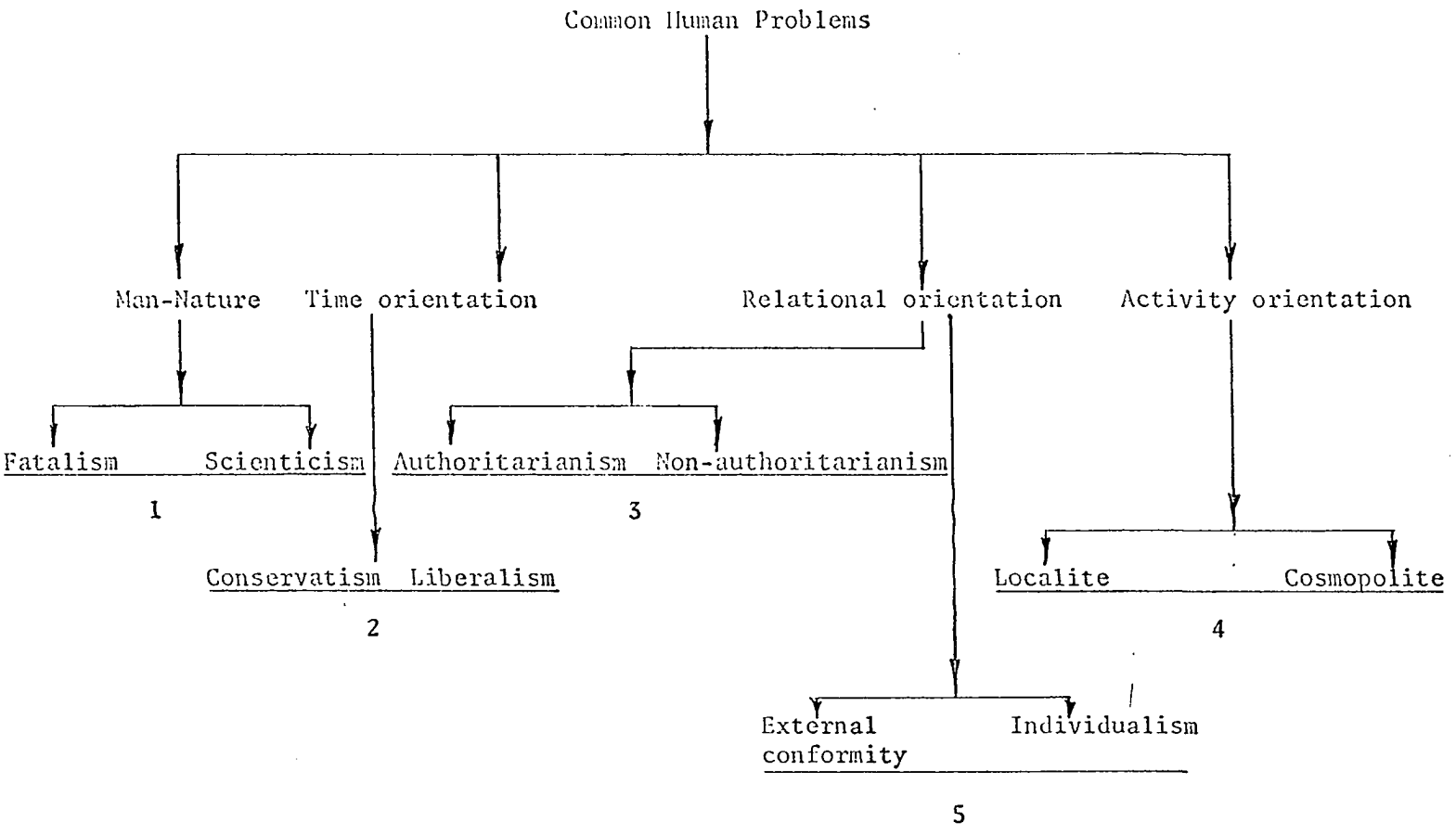

Figure 3. The five dimensions of general value orientations

institutions, practices and customs, 5) supporting traditional and religious creeds, 6) looking to authority for guidance, and 7) viewing social problems as results of individual incompetence and immorality.

Liberalism contains opposite trends and it tends to be associated with: 1) spirit of adventure, 2) quest for new ideas, 3) modification of old ways of life, 4) fearless and critical search for new ways of life, 5) favoring rational social experimentation, 6) critical assessment of old religious traditions, and 7) viewing social problems as symptoms of underlying social structure.

Keeping in view the above characteristics of conservatism - liberalism concepts, they can be related to the time orientation. This relationship has been indicated in Figure 3.

Conservatism is defined as a positive attitude toward traditional institutions and practices and maintenance of the status quo producing a tendency to resist change. Liberalism is defined as a positive attitude towards searching for new ways and new ideas and change in the status quo.

Fatalism - scienticism Ontologically the concept of subjugation to nature, harmony with nature and mastery over nature as variations in the man-nature orientation is known. On the basis of this notion, the dimension of fatalism - liberalism has been related to the man-nature dealing with relation of man with nature. This relationship has been indicated in Figure 3.

Fatalism in this study is defined as a belief that human situations and acts are predetermined by some supernatural power and can not be

influenced by individual volition or by any human act.

On the other hand, scienticism is defined as a belief that human situations are the result of natural and/or social forces which can be understood and changed by human volition or human action.

The above concept of scienticism, does not place any emphasis on the formal training in science. The dominant, guiding spirit is scientific inquiry and thinking. The Baconian concept of mastery of man over nature, constitutes the prevading trend in the present formulation of the concept of scienticism.

Authoritarianism - non-authoritarianism The classical work of Adorno and others (2) and the vast body of literature succeeding it demonstrate that the concept of authoritarian personality is one that has held the sustained interest of the social scientists. The main features of authoritarianism are: 1) craving for unquestioning obedience and subordination, 2) servile acceptance of superior authority, 3) scorn for weakness, 4) rigidity, 5) rejection of out group, 6) conventionality, 7) intolerance of ambiguity, and 8) cynicism.

In the present study authoritarianism has been defined as a positive attitude toward accepting an idealized person or institution for setting tasks, prescribing procedures, and/or judging results without permitting others to share in the decision process.

Non-authoritarianism has been defined as a positive attitude toward accepting the decision process as a shared responsibility and understanding and tolerance of variations in thinking and behavior.

In both the definitions of authoritarianism - non-authoritarianism, the main stream of thought is the man's relational orientation dealing

with his relationship with others. Keeping this aspect in view the dimension of authoritarianism - non-authoritarianism has been related to the relational orientation in Figure 3.

Localite - cosmopolite These terms were adopted from Zimmerman (96) who used them as translations of Tonnies' well known distinction between gemeinschaft (localistic) and gesellschaft (cosmopolite). In sociological writings of Simmel (95), Cooley (18), Durkheim (26), among many others, though different terminologies are used, similar notions are involved.

Merton (54) points out that the localite largely confines his interests to his own community. He is preoccupied with local problems, to the virtual exclusion of the national or international scene. He is, strictly speaking, parochial. The cosmopolite has some interests in the community and must of course maintain a minimum of relations within the community since he, too, exerts influence there. However, he is also oriented significantly to the world outside the community, and regards himself as an integral part of that world. He resides in his own community but through his activities he lives in the Great Society. Merton (54) states, "If the local type is parochial, the cosmopolitan is ecumenical." The emphasis on an individual's activities puts this dimension (localite - cosmopolite) in relation to activity orientation as shown in Figure 3.

The terms localite and cosmopolite are being applied to types of influential persons indicating their orientation toward certain sources of information; external, internal, etc. The chief criterion for distinguishing the two were found in their orientation toward local

sources of information available within the community as against external sources of information available from other sources outside the community.

External conformist - individualism External conformity has been conceptualized as decision making by an individual only because his decision was in agreement with his friends, neighbors and relatives or other important referents or referent groups. This value orientation has been used by various theorists, recently by Williams (94). Individualism is defined as the conviction that the best state of affairs is one in which self-reliant and independent men assume the responsibility for their own decisions.

The main ingredient of both the definitions is the relational aspect, which helps to relate the dimension of external conformity - individualism to the relational orientation in Figure 3.

In summary, the five general value orientation dimensions are: conservatism - liberalism, fatalism - scienticism, authoritarianism - non-authoritarianism, localite - cosmopolite, and external conformity - individualism. They have been deductively derived essentially from the Kluckhohn and Strodtbeck (44) model as described above. Again through Table 1, it has been indicated how these five dimensions relate back to the two types of value orientation designated as folk and urban. That is to say, conservatism, fatalism, authoritarianism, localite, and external conformity of general level value orientations were derived from the overall theoretical pattern types of value orientation such as gemeinschaft, sacred, primary, traditional, and folk. The other end of the

dimension such as liberalism, scienticism, non-authoritarianism, cosmopolite, and individualism were derived out of the overall theoretical pattern type of value orientation such as gesellschaft, secular, secondary, rational, and urban.

Occupational value orientation As discussed earlier, occupational value orientation is conceptualized as a relevant instance of specific value orientation, and it pertains to a specific situation, i.e., farming as an occupation. The theoretical model developed so far in the preceeding pages was found to be inadequate for deriving variables for the occupational value orientation. The eight conceptual variables of occupational value orientation were, therefore, not selected out of the theoretical framework but were developed inductively through a pilot study. This study will be discussed in the methodology section. The reason for this approach was lack of sufficient knowledge "a priori" available in the existing theoretical sociological material regarding the area of occupational values under investigation. However, the variables selected through the pilot study may have implications inductively back to the framework. In the following section an attempt will be made to develop a conceptual framework for the discussion on occupational value orientation.

Adler's (1) classification of different meanings provided a useful frame of reference for the conceptualization of occupational value orientation. Adler sees the concept of value and value orientation applied variously to 1) absolute quantities inherent in events or in contemplated state of affairs, 2) characteristic of objects as apprehended by people, 3) characteristic of people who do the evaluating, and

4) the actual behavior of people toward object.

Adler's class 2 and 3 help to conceptualize the occupational value orientation in this dissertation. Value orientations are regarded as the criteria applied by a cultivator to assess an object (occupation). Among the criteria (value orientations), he tends to favor or choose some more than others. Therefore, his occupational value orientations form a hierarchical pattern.

Sorokin and Zimmerman (78), Taylor (80), Bernard (7), and Loomis and Beegle (50) have enumerated and elaborated the values and beliefs which they considered to be predominantly rural and urban in nature. During the early part of this century, most observers contended that the value orientations of rural (folk) people were quite homogeneous and distinct from the value orientations of their urban counterparts. They constructed elaborate taxonomies which carefully classified the rural population on a multitude of dimensions. One of these devices, called the "rural-urban continuum," portrayed rural inhabitants as highly traditional, familistic and hard working in contrast to urban people who were more independent (freedom)[1], innovative (scienticism), security-loving and profit maximizing (economic). According to Veblen (88) leisure is an urban value.

The eight occupational value orientations inductively derived as a result of the pilot study were: hard work, familism, traditionalism, freedom, scienticism, economic, security, and leisure. In the following

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[1]Concepts in parentheses added by this author to show relation to present concepts used.

section each one will be defined and a rationale will be developed to classify the eight occupational value orientations into the two types of value orientation--folk and urban.

Hard work The value on physical work, as a means to achieve ends has been associated with a norm of the Protestant Ethic and also associated with individual prestige and status. In this study the definition of hard work given by Ramsey and others (66) has been accepted. According to them, value is placed on hard work as an end in itself and this value may influence the decision making process or choice criteria of the farm operator. They hypothesized the relationship between the value orientation of hard work and the adoption as negative. The belief in hard work indicated that the cultivator would judge success in terms of working hard and would think of hard work as a method of solving the problems of the cultivator. The emphasis on hard work (physical work) has been identified as a characteristic value of the rural social system which has often been valued to such extent as to become elevated to the status of an end in itself (94).

In contrast it may be conceptualized that in the more scientifically oriented urban behavior, hard work may be regarded as only an alternative means to accomplish chosen ends. Capital purchased farm inputs, such as machinery, may make it possible to optimize profits by substituting these inputs for hard work. The urban oriented person makes this substitution freely without any feeling that he has violated a value orientation--namely hard work.

The scientifically urban-oriented individual would also probably

look with favor on taking time to gather information, taking time to make deliberate decisions and planning--he would consider these as essential inputs for rational decision making. Since these activities are not "physically hard work" the folk-oriented individual would probably regard these activities as in conflict with his hard work value orientation.

Traditionalism This involves uncritical adoption of precedent as the criteria of choosing a course of action. The phrases "what you have been used to" and "what has been done before" describe this perfectly (66). In the traditional value orientation means are often regarded as ends in themselves. Ramsey and others (66) studied the relationship of traditionalism to farm practice adoption. The hypothesis tested was that traditionalism is negatively related to the practice adoption scale. Traditionalism is associated to non-rational and traditional social system such as folk social system.

The placing of this concept on the folk-urban continuum appears relatively straightforward in this study. Over the centuries Indian cultivators have developed well ingrained, widely accepted traditional farm practices. Village people have lived in relative isolation from outside scientifically developed and recommended new farming practices. Over the past decade outside change agents and agencies have attempted to introduce new (non traditional) farming practices. The objective of these activities is to obtain acceptance of the new practices--to influence the cultivator to break with tradition. Certainly the acceptance of modern agricultural technology can not be regarded as "traditional" at this stage in India's development. However, it is

believed there will be differential orientations toward traditionalism among the cultivators. Thus, traditionalism is regarded as a representation of the folk value orientation, and is expected to be negatively related to adoption.

Familism This is the characteristic which leads to the referral of decisions to the family norms due to value placed on extended large family. In familism value orientation, family norms are regarded as ends in themselves.

The extended family often includes two or four generations. The basic control of decisions rests with the eldest living male member, or female if the husband is deceased. Thus, control rests with older people, who tend to be more fatalistic, traditional, conservative and have a higher security orientation. This leads to a logical derivation that the greater commitment to this type of familism, the less the probability of accepting new farm practices.

Wilkening (92) studied familism and found those farmers ranking highest in familism scale adopted fewer innovations. Ramsey and others (66) pointed out that the emphasis on family norms is the main feature of familism and they place this concept in the framework of traditionalism, except that traditional patterns are not limited to those in one's own family.

Freedom The value toward freedom is conceptualized as a state of being free from external power control, such as authority. The concept of freedom, in rural setting of India, may have a different meaning than in the United States of America.

Nelson and others (57) pointed out that cultivators in the United

States of America who cling to farming as a way of life rather than as a vocation, describe freedom as an aspect of farming. This may not be so in the case of cultivators in India, who live in villages and have always been subjected to a great many power controls from outside. Their occupation (farming) has also been the victim of exploitation by physical and natural forces, and therefore they have come to depend on external forces to control their situation. The struggle for freedom or the value given to freedom from external power control is mainly a phenomenon of urban value in India.

However, it is believed that different individuals in rural India do possess differential value orientations regarding freedom. It appears logical to expect that the cultivator, who breaks with tradition and adopts new practices, will have a value orientation toward freedom--freedom to make his own decisions even though he is in conflict with commonly accepted norms of family, friends, and community. Thus, freedom is placed on the urban end of the folk-urban continuum.

Scienticism This conceptualization is similar to those given earlier. Scienticism is a belief that human situations are the result of natural and/or social forces which can be understood and changed by volition of human effort. Bose (9) observed that those cultivators who were scientific in their outlook adopted more recommended practices. There was a positive correlation between adoption scores and scores for science significant at the 1 per cent level. Hobbs (36) in a study of 315 commercial farmers in Iowa found the coefficient of correlation between belief in science and practice adoption significantly positive at the .01 leveloof probability. Ramsey and others (66)

studied scientific orientation. They contended that it can be tentatively accepted that a farm operator oriented toward science as a value is more inclined to obtain information to evaluate critically his own situation and to adopt the practice.

Belief in science and the scientific method of decision making is a value orientation deeply ingrained in almost all conceptualization of the urban type of social system.

Economic The economic value can be conceptualized as that characteristic which places a high importance on economic ends and alternatives (means) which will result in higher economic gain or margin of profit. Economic rationality becomes a core in every course of action, which is the characteristic of the ideal type urban social system. Included also in this notion is the action orientation towards attainment of discrete and empirical goals such as profit maximization by labor saving devices to attain economic ends. Among the proponents of this position are Weber (90) and Parsons and Shils (63). In this sense traditionalism is the antithesis of rationality and economic motivation. On the basis of this argument economic value orientation is assumed to be associated with the urban type of social system.

Security This involves a feeling of certainty and protection against risk in selecting ends and means.

The concept security is difficult to place on the folk-urban continuum. From one point of view it may be argued that a security orientation may indicate an unwillingness to take risk.

However, it may be postulated that those individuals who perceive one of the favorable aspects of farming as offering security may have

arrived at this perception through the following pattern of reasoning and actions. Through the adoption of new technology (irrigation, pest control, disease resistant varieties) the cultivator may believe he has reduced the risks in farming. He may have proven, to his own satisfaction, that he can cope with his environment, he can raise food and fiber for his family, he can sell enough of his increased production to purchase essentials and perhaps some nonessentials--thus he sees his occupation favorably in terms of the security offered. In contrast the cultivator, who has not adopted technology that may reduce risks, may be living very close to subsistance, sees himself as being manipulated by elements of his environment and thus look at his occupation as being insecure.

The decision on which logic to accept is not clear cut. However, the latter postulated position is taken in this study--seeing one's occupation favorably in terms of the security. People who are illiterate, tend to be empiricist, and live close to a subsistance level, may regard any change as a high risk decision. Thus, any new practice represents a risk (a threat to their security) because the outcome is perceived as not being known with any probability. Thus, from this frame of reference the most secure position is the status quo. On this basis of the above notion, security is assumed to be a value orientation of urban and is expected to be positively related to adoption.

Leisure The value toward leisure emphasizes the desire for having adequate leisure from work. This concept is an antithesis of hard work and therefore it has been assumed as a characteristic of the urban social system. The concept leisure stems out of material comfort,

progress, and efficiency which are all characteristics of the urban side of rural-urban continuum. A high value orientation toward leisure is expected to be positively related to adoption.

In summary, on the basis of the above discussion, the eight variables of occupational value orientation have been classified into two types of value orientation: folk and urban. That is to say, hard work, traditionalism, and familism are assumed to be associated with the overall theoretical pattern type of value orientation such as gemeinschaft, sacred, primary, traditional and folk. The other five occupational value orientations such as leisure, economic, security, freedom and scienticism are assumed to be associated with the overall theoretical pattern type of value orientation such as gesellschaft, secular, secondary, rational, and urban.

Type of value orientation and level of value orientation This section will summarize the preceeding discussion on the type of value orientation (folk and urban) and the level of value orientation (general value orientation and occupational value orientation (specific) with the help of Figure 4. Figure 4 also presents the linkage of these two general concepts. Hopefully, the figure will form the basis for the next discussion, i.e., derivation of the hypotheses. Some symbols used to denote the corresponding characteristics under consideration are as follows:

F = Folk

U = Urban

G = General

O = Occupational (specific)

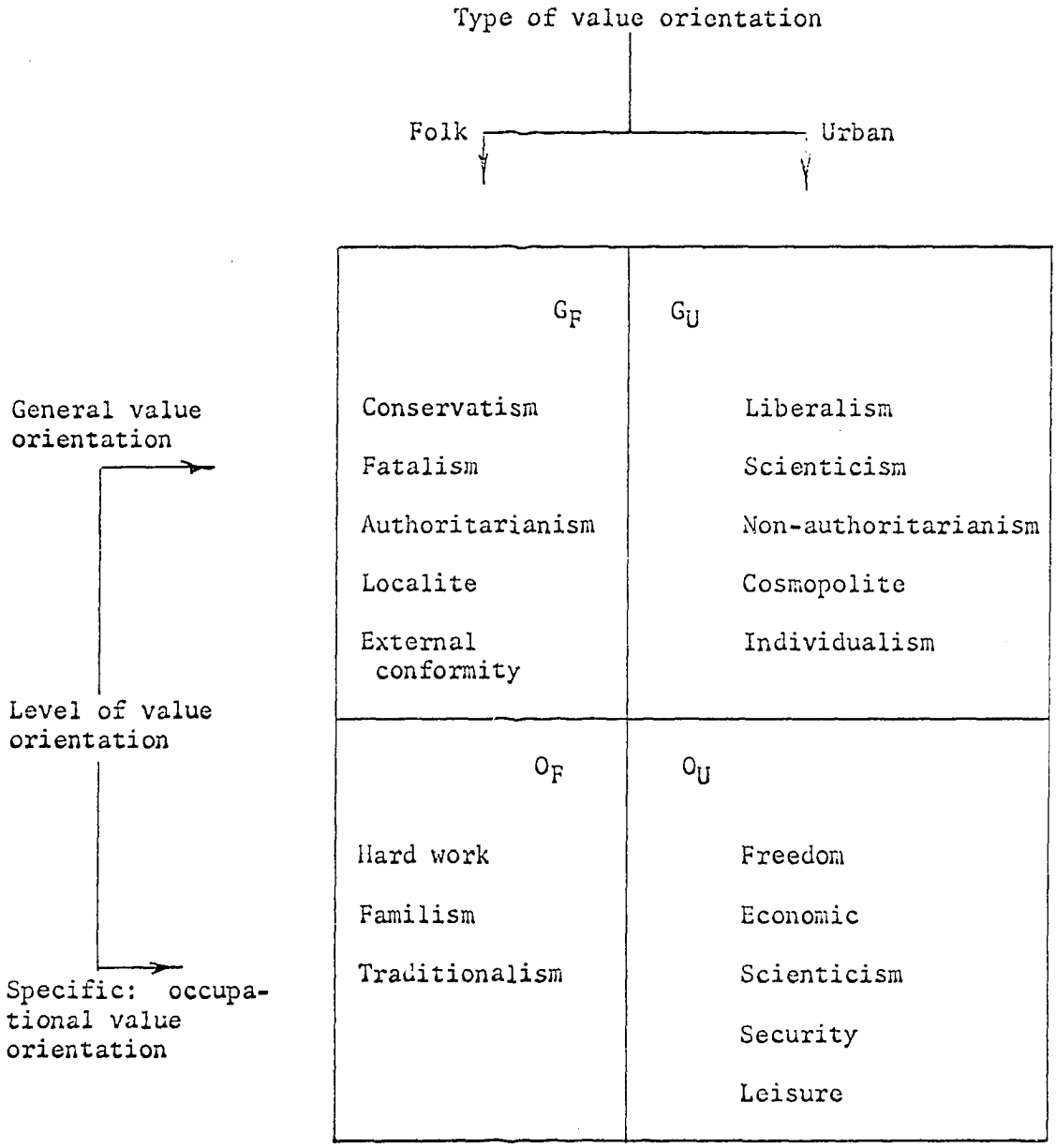

Figure 4. Type of value orientation and level of value orientation

G_F = representing all the value orientations associated with the folk types at the general level

G_U = representing all the value orientation associated with the urban types at the general level.

O_F = representing all the value orientations associated with the folk type at the occupational level (specific)

O_U = representing all the value orientations associated to the urban type at the occupational level (specific).

Derivation of Hypotheses

Based on the above theoretical framework and the relationships presented in the preceeding Figure 4, the following theoretical, general, sub-general and supporting sub-hypotheses are derived.

Theoretical hypothesis

Adoption behavior of cultivators will vary with and can be in part predicted from the type and level of value orientation that they possess.

General hypothesis 1 The cultivators possessing more of the value orientations associated with folk type will exhibit a lesser degree of adoption behavior.

The above general hypothesis implies that the cultivators possessing more of the value orientations associated with urban type of value orientations will exhibit a greater degree of adoption behavior.

"If more of F^1, then a lesser degree of Y^2."

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[1]Representing the folk type of value orientations.

[2]Representing the adoption behavior.

"If more of U^1, then a greater degree of Y."

Sub-general hypothesis 1-1 The cultivators possessing more of the value orientations associated with general value orientations of folk type will exhibit a lesser degree of adoption behavior.

Putting the above notion of sub-general hypothesis in an abbreviated "if" and "then" form the hypothesis can be restated as:

"If more of G_F^2, then a lesser degree of Y."

"If more of G_U^3, then a greater degree of Y."

Sub-general hypothesis 1-2 The cultivators with a greater degree of occupational value orientations of folk type will exhibit a lesser degree of adoption behavior.

Putting the above notion again in abbreviated "if" and "then" form the above sub-general hypothesis can be restated as:

"If more of O_F^4, then a lesser degree of Y."

"If more of O_U^5, then a greater degree of Y."

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[1]Representing the urban type of value orientations.

[2]Representing all the value orientations associated with folk type at general level.

[3]Representing all the value orientations associated with urban type at general level.

[4]Representing all the value orientations associated with the occupational value orientation (specific level) of folk type.

[5]Representing all the value orientations associated with the occupational value orientation (specific level) of urban type.

General hypothesis 2 Adoption behavior of cultivators can be in part predicted from the type and level of value orientations that they possess.

Sub-general hypothesis 2-1 Type and level of value orientations possessed by cultivators will explain a significant amount of variation in adoption behavior.

The above general hypothesis 2 and its related sub-general hypothesis 2-1 will be empirically examined in the additional analysis section of this dissertation, where situational and personal variables will also be included in the analysis.

Following are the sub-hypothesis pertaining to sub-general hypothesis 1-1 and 1-2. Here sub-general hypothesis 1-1 and 1-2 are first given in the manner stated earlier, then the corresponding sub-hypothesis.

Sub-general hypothesis 1-1 The cultivators possessing more of value orientations associated with the general value orientation of folk type will exhibit a lesser degree of adoption behavior.

"If more of G_F then a lesser degree of Y."

Sub-hypothesis 1-1-1: There will be a negative relationship between conservatism value orientation and adoption behavior.

Sub-hypothesis 1-1-2: There will be a negative relationship between fatalism value orientation and adoption behavior.

Sub-hypothesis 1-1-3: There will be a negative relationship between authoritarianism value orientation and adoption behavior.

Sub-hypothesis 1-1-4: There will be a negative relationship between localite value orientation and adoption behavior.

Sub-hypothesis 1-1-5: There will be a negative relationship between external conformity value orientation and adoption behavior.

The above sub-hypotheses are stated in terms of only one side of each continuum of general value orientation. Given the one side of a continuum the other side becomes latent.

Sub-general hypothesis 1-2 The cultivators with a greater degree of occupational value orientation of folk type will exhibit a lesser degree of adoption behavior.

"If more of O_F, then a lesser degree of Y."

Sub-hypothesis 1-2-1: There will be a negative relationship between traditionalism value orientation and adoption behavior.

Sub-hypothesis 1-2-2: There will be a negative relationship between familism value orientation and adoption behavior.

Sub-hypothesis 1-2-3: There will be a negative relationship between hard work value orientation and adoption behavior.

Sub-hypothesis 1-2-4: There will be a positive relationship between freedom value orientation and adoption behavior.

Sub-hypothesis 1-2-5: There will be a positive relationship between economic value orientation and adoption behavior.

Sub-hypothesis 1-2-6: There will be a positive relationship between scienticism value orientation and adoption behavior.

Sub-hypothesis 1-2-7: There will be a positive relationship between leisure value orientation and adoption behavior.

Sub-hypothesis 1-2-8: There will be a positive relationship between security value orientation and adoption behavior.

Unlike all the sub-hypotheses pertaining to sub-general hypothesis 1-1 the above sub-hypotheses for the sub-general hypothesis 1-2 are stated by recognizing all the occupational value orientations associated with both folk and urban type. This is done as each one of them is used as a single variable rather than a polar type continuous variable.

METHOD AND PROCEDURE

This chapter will deal with the empirical measures which will be used in testing the hypotheses developed previously. The chapter will consist of three parts. The first part will describe the explication process involving development of empirical measures and empirical hypotheses. The second part will describe the procedures followed in sampling and collecting the data. The final part will describe the statistical procedure used in the analyses of the data.

Explication Process

This section is concerned with the process of transforming the general level concepts in the general hypotheses into more precise measures for empirical testing. Carnap (12) has called this process the explication process.

The explication and operational definition of a concept is crucial to any research endeavor. The function of the operational definition is to more precisely define a theoretical concept by describing the operations which observe, measure and record a given phenomena (33). The operational definition makes more explicit to other researchers what a concept "means." The relation between the theoretical concept and the corresponding empirical concept has been referred to as "epistemic correlation." Northrop (59) states it in this manner:

> It is by means of epistemic correlation that unobservable entities and relations designated by concepts and postulations take on an operational meaning and thereby become capable of being put to an experimental test. Thus it is the relation of epistemic correlation which makes the operational meaning

> of a theoretical concept of science possible and which make the operational definitions of scientific concepts important." (59, pp. 122-123)

In the theoretical hypothesis, as stated in the previous chapter, the two general level concepts are behavior and value orientation. The epistemic correlation[1], empirical measures and empirical hypotheses[2] relating to these two general level concepts in this study are discussed below.

General concept 1 - behavior

A theoretical discussion pertaining to this general level concept was given in the previous chapter. In this dissertation the term behavior has been conceptualized at a lower level as adoption behavior. The rationale to explain this first explication is not repeated here. It is necessary, however, to relate the concept behavior to its empirical measure.

E. C. 1: Adoption behavior is a measure of behavior.

E. C. 2: Adoption quotient is a measure of adoption behavior.

Measurement of adoption: adoption quotient The dependent variable of this study is a measure of the adoption of farm practices. There is a lack of general agreement on the procedure of measurement of adoption. The problem is further aggrevated by the fact that even the term adoption has been used in many different ways. In other words, the conceptualization of the phenomenon of adoption lacks general consensus.

During the last decades researchers exhibited interest in the

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[1]Epistemic correlation will hereinafter be indicated as E.C.

[2]Empirical hypothesis will hereinafter be indicated as E. H.

measurement of adoption and measurement scores were developed for various purposes. Among those who utilized a measuring scale for adoption of improved farm practices in some form or other were Hoffer and Strangland (37), United States Department of Agriculture Bureau of Agricultural Economics (85), Kaufman (41), Wilkening (91, 92), Lionberger (49), Pederson (64), Marsh and Coleman (51), Duncan and Kreetlow (25), Fliegel (32), Copp (19), Van der Ban (86), Lindstrom (48), Emery and Ocser (29), Straus (79), Ramsey and others (66), Beal and Rogers (4), Rogers and Capener (70), Bose (9), and Bose and Dasgupta (10).

Hoffer and Strangland (37) introduced an important variable in measurement--the potentiality of adoption by a particular farmer by noting the nature of applicability of the practice. He also used the concept of possible adoption, and studied adoption of a practice in terms of the ratio of the number of possible adoptions to the number of actual adoptions, as well as in terms of the number of practices adopted by each grower.

Wilkening (91, 92) reported the use of an index of improved farm practices. He presented a detailed account of the procedure followed in evolving the index. The scoring of the index emphasized the extent of adoption. The study of various factors associated with adoption indicated the differential nature of the practices and, therefore, Wilkening suggested differential weights in the adoption index. Wilkening also realized the importance of potentiality of adoption and likewise stated that since some practices were not applicable on particular farms, the index of adoption used was the percentage that practices adopted was of the number applicable for each operator.

Marsh and Coleman (51) used practice adoption scores in a study of 393 farm operators in a Kentucky county. Information was obtained on the extent to which each of the operators had tried and were using 21 recommended farm practices. A practice adoption score was computed for each farmer. This score was the percentage of applicable practices that the operator had adopted.

Duncan and Kreetlow (25) reported that they used a 25-item-index-of-farm-practice adoption, adapted from an index developed by Wilkening. Each respondent was given a score based on the number of practices he had adopted from the list of 25. They did not report whether potentiality of adoption or any other feature of adoption scales was considered.

Fliegel (32) constructed an index of adoption of farm practices using the correlation of several adoption variables. He factor analyzed each of the 11 practices selected, non-adoption was given a value of 0 and adoption a value of 1.

Copp (19) in the same way, critically considered the aspect of measurement of adoption. He tried to prepare a Guttman-type of scale to measure the degree of general predisposition to follow recommended practices. He then employed correlation techniques to select items for the index of adoption.

Lindstrom (48) studied adoption of four practices. Through interviews information was collected regarding a number of farmers who had 1) a favorable attitude towards a practice, 2) tried the same practice, and 3) had adopted the practice at the time of the investigation.

Ramsey and others (66) used two scales of measurement which they termed as 1) practice adoption scale and 2) lime scale, to measure

behavioral adoption and cognitive adoption respectively. The practice adoption scale included four practices applicable to dairy farming, which were recommended for any size of farm operation. The lime scale, intended to locate the farmer in the complex of cognitive adoption. The scale included five aspects such as 1) knowledge about test of lime requirement, 2) actual testing for pH, 3) understanding the significance of the test, 4) application of lime, and 5) technical knowledge on the effect of lime on soil. On both the scales one point was given for each item adopted or known by the farmer. The resulting score scales ranged from 0 to 4 on the practice adoption scale and 0 to 5 on the lime scale.

Beal and Rogers (4) studied in detail the adoption of two farm practices, 2, 4-D spray and feeding of antibiotic feed supplements to hogs with a sample of 148 farm operations in Iowa. A simple adoption scale was computed which credited an individual with one point for adoption and zero points for non-adoption of practices.

Rahim (65) conceived 4 stages in the adoption process, viz., awareness, information, trial and adoption. Each stage was assigned 1 point, which implied that an individual in the awareness stage, for a particular practice, would receive a score of 1 and in the adoption stage would receive 4. The scores thus obtained on different practices were added up and expressed as percentage of the maximum possible total score. In this scheme, attention was focussed on the entire adoption process.

Bose (9) used an adoption index in a study conducted in ten selected villages in West Bengal, India. Bose defined adoption index as the number of practices adopted. It is not clear whether he took into consideration the potentiality of applicability of the practices.

He gave equal weight to all the practices.

Components of adoption In the present investigation the components of adoption fall into two groups. From the point of view of the total number of practices the main important factor is that of applicability of the practices available or advocated to him. In the case of the individual practices, the factors to be considered are potentiality and extent, time, consistency, and weight. These variables are discussed below.

Applicability Under this component three aspects are considered, namely, 1) the total number of improved practices recommended to the community, 2) the total number of improved practices which the farmer can adopt (potentiality), and 3) the total number of improved practices adopted by the cultivator.

Potentiality Potentiality of the use of a practice is conceived as the maximum degree to which the cultivator can extend his adoption, if he so wills, depending on the maximum utilization of the resources he commands or can command. For example, in the case of a wheat grower his possession of 10 acres of land is assumed to justify his use of the improved varieties of wheat seed applicable in his case. This means that he has the potentiality of adoption of improved wheat seed. But if he usually plants 7 acres to wheat, and that is the maximum level up to which he can grow wheat, no matter whether it is improved seed or not, his potentiality of use of wheat in such case is 7 acres.

Extent Extent of adoption is the degree to which the cultivator has actually adopted. When the extent of adoption equals the

potentiality of use, the adoption is recognized as a full adopter at that time, and when the extent is nil, it is considered as non-adoption. Between these two extremes a number of positions can be conceived and measured.

Time The aspects to be considered in relation to the time component are: a) the year when the improved practice was first communicated to the community, b) the year when the practice was first adopted by the cultivator, and c) the year when the investigation was carried out.

Consistency This component is primarily concerned with the continuation and discontinuation of adoption of a practice. Consistency seems to form an important component in preparing a measurement scale. It may not be possible to say definitely that an adopter over a longer period is necessarily a more confirmed adopter, but it appears that in measuring adoption behavior credit should be given for consistency of adoption. Consistency is conceived as continuity of adoption, with a trend towards maximization of adoption efforts and their maintenance through the years, with minimum variations from year to year.

Consistency in this sense can be studied by taking into account, a) gaps, i.e., years in which the practice was not used, and b) the extent-potentiality relationship in a practice for each year. The extent potentiality relationship is obtained by the ratio of the actual extent of adoption of a particular practice in a given year to the potentiality of adoption of that practice in the same year.

Weights The improved practices communicated to the cultivators differ in their difficulty of adoption by the cultivators. It is customary to give more credit to the performance of a more difficult task. The sub-Committee for the Study of the Diffusion of Farm Practices of North Central Rural Sociological Committee, Iowa (73) classified practices in terms of their complexity, which roughly represents their probable speed of adoption (which may be expected to follow). The Committee considers various changes, requiring varying adjustments as contributing to complexity of practices.

Adoption quotient[1] For the purpose of this dissertation the method for measuring adoption behavior was taken from Chattopadhya (16). The adoption quotient (AQ) is a ratio scale designed to quantify the adoption behavior of a cultivator. The scale has been constructed using all the components of adoption discussed above.

The scale evolved gradually. Tests and re-tests were undertaken at each important phase. The final form of the scale developed by Chattopadhya (16) is presented here. The scale is as follows:

$$AQ = \frac{\sum_{j=1}^{N} y_j W_j}{\sum_{j=1}^{N} w_j} \times 100$$

where $$y_j = \frac{\sum_{1}^{t_p - t_i} (e_j/p_j)}{t_p - t_i} .$$

[1]Sample of proforma for calculation of adoption quotient similar to one used by Chattopadhya (16) is presented in Appendix B.

where N = number of practices which the individual has the potentiality to adopt.

w_j = weight to be given to j^{th} practice based on its difficulty of adoption determined from a list of differential weights of practice (1 to 5)

$\sum_{1}^{t_p - t_1}$ = summation over each year from t_1 to t_p.

t_p = time of investigation (year)

t_1 = time of first introduction of j^{th} practice in

e_j = extent of adoption of any particular (j^{th}) practice in a particular year

P_j = potentiality of any particular (j^{th}) practice.

For obtaining AQ scores of cultivators in this investigation, the practices selected for determination of relative scores of each cultivator were those recommended in the locality by the Indian Agricultural Research Institute as well as the Community Development Block. In order to secure a range in scale values those practices adopted by all the cultivators or practices that were adopted by none were not selected. The agricultural practices selected were improved varity of wheat seed, use of fertilizer, soil inverting plough, old pad thresher and weedicide 2, 4-D. The time of the first introduction for each practice was 1952, 1952, 1953, 1955, 1955, respectively. A rating scale was prepared by Chattopadhya (16) to derive weights for each practice on the basis of intrinsic difficulty of various practices. The rating scale involved 7-point ranging from +3 to -3. The scale points were on the dimensions of "ease of adoption": easy to adopt, no opinion, and difficult to adopt.

For each practice the pattern was as follows:

Easy to adopt: "Extremely" easy to adopt_____

"Quite" easy to adopt_____

"Rather" easy to adopt_____

No opinion_____

Difficult to adopt: "Extremely" difficult to adopt_____

"Quite" difficult to adopt_____

"Rather" difficult to adopt_____

Any response in the "extremely" easy to adopt received a score of -3, a response in the middle received the score of 0, and the response in "extremely" difficult to adopt received +3. The scores received by each practice were added and the means were determined. The range observed was from -2.13 to +1.60. When the lowest score was made 0 by adding +2.13 to each, the maximum mean score became 3.73. Using these data, the practices were arranged in order of difficulty and through this process the weightage for each practice was determined.

The rating scale was administered to 30 persons. They included professors of agronomy, agronomists, professor of agricultural economics, vegetable specialists, psychologists, rural sociologists, agricultural extension specialists of the Indian Agricultural Research Institute as well as block development officers, agricultural extension officers, agricultural extension workers (field level) and two post-graduate students of agricultural extension working in this locality for their Ph.D. degrees.

The weights, thus obtained through this process for each practice

were: for wheat seed, 1; for fertilizer, 2; for soil inverting plough, 3; for thresher, 4; and for weedicide 2, 4-D, 5.

Validity of the AQ scale Chattopadhya (16) used rank-order coefficient of correlation to test the validity of the scale measuring the adoption behavior of individuals. Rank-order correlation coefficients were calculated. The procedure of this rank-order correlation is discussed by Guilford (34).

Ten cultivators of high AQ and 10 cultivators with low AQ were taken. A list was computed by mixing these 20 names at random. A 5-point check list was prepared, range being from 1 to 5, for measuring the degree of agreement between judges' opinion about these 20 cultivators and their ranking on the AQ scale. A total of 3 judges were selected. The judges were the staff members of the Intensive Cultivator Scheme of the Indian Agricultural Research Institute. They had intimate knowledge of the villages studied. The criteria on which they were to rate the individuals on the check list were explained in detail. The calculated value of rho (the rank difference coefficient of correlation) was 0.959 which was significant at 0.01 level. The inference, therefore, may be drawn that the scale was valid enough to measure the adoption behavior of cultivators.

General concept 2 - value orientation

The development of empirical measures for the second general level concept value orientation is more difficult. In the previous chapter two components of value orientation were discussed. The two components of the concept of value orientation are 1) type of value orientation:

folk and urban, and 2) level of value orientation: general and specific. The specific being the occupational value orientation. Thus, the one step in the explication process has been completed; transforming the concept of value orientation into two major components. These two sub-level concepts or components have also been discussed in the previous chapter. Therefore the rationale for delineating the two concepts is not repeated here. It is necessary, however, to further operationalize each of 1) the type of value orientation and 2) the level of value orientation for empirical measurement. But before this is done, another set of epistemic correlation is needed to relate the original general level concept value orientation and its two components with empirical measure. It was stated that dichotomous classifications given in the previous chapter will be treated as two types of value orientation: 1) folk type, representing gemeinschaft, mechanical, traditional, primary, and sacred, and 2) urban type, representing gesellschaft, organic, rational, secondary, and secular.

E.C. 3: Folk and urban is a measure of types of value orientation.

In the theoretical orientation section, the folk and urban types of value orientation were conceptualized and characterized at the general level as well as the specific level. The general level being called a general value orientation and the specific level being called the occupational value orientation. Based on the above notion, further epistemic correlations were developed.

E.C. 4: The value orientations conservatism, authoritarianism, fatalism, localite, and external conformity are

logically derived general level sub-concepts of the folk type of value orientation.

E.C. 5: The value orientations liberalism, non-authoritarianism, scienticism, cosmopolite, and individualism are logically derived general level sub-concepts of the urban type value orientation.

E.C. 6: The orientations hard work, traditionalism, and familism are logically derived specific (occupational) level sub-concepts of the folk type value orientation.

E.C. 7: The orientations such as leisure, economic security, freedom, and scienticism are logically derived specific (occupational) level sub-concepts of the urban type value orientation.

Empirical measures of value orientation: a review Some other studies have reported the procedure used for studying values. Hoffer and Strangland (37) in a survey of 93 Michigan farmers who grow 5 or more acres of corn in 1955 studied attitude and values in relation to adoption of approved practices in corn-growing. The procedure used in the Hoffer and Strangland study was to ask the farmer to respond to a series of statements about farmers and farming, without reference to any specific value whatever. Each statement was read to the informant and he was asked if he thought he was like the individual described in that statement, somewhat like him, neither like or unlike him, somewhat unlike him, or finally, unlike him. The investigators used these five statements, for each of the five values studied.

Ramsey and others (66) studied 12 values. They used a Guttman scale to determine the nature of the value orientation developed for each of the 12 values, and all coefficients equal to at least 0.90.

Bose (9) studied six values. A questionnaire containing 30 statements was used--five statements for each of the six values. The validity of the instrument was established by following Likert's procedure.

Rogers (71) studied "agricultural magic" farming beliefs which were developed from traditional sources and which lack any firm scientific explanation. A crude index called the "Agricultural Magic Scale" was constructed with two items--undertaking agricultural operations with "signs of the moon" and water-witching for exploiting "water vein" to drill for wells. The scale was a four-point one with categories of "agree quite a bit" to "disagree quite a bit."

Wilkening (93) compared four techniques of assessing farm family values, viz., direct questioning, choosing between hypothetical situations, verbal ranking of family goals, and behavioral data in the form of matter of possessions, family expenditures and social participation.

Fliegel (32) prepared an index of familism. The index represented "an attempt to distinguish the relative concentration of efforts of the farm family toward achievement of group as opposed to individual ends." Seven items, each emphasizing a different aspect of the relationship within the family and wider circle of relatives, were taken as indicators of familism.

General value orientation scales The quantitative measurement of the five dimensions of general value orientation: conservatism -

liberalism, fatalism - scienticism, authoritarianism - non-authoritarianism, localite - cosmopolite, and external conformist - individualism required measurement scales for each one of the dimensions labeled as variables. It may be pointed out that most of the indices developed in the United States of America, could not be used as the soci-cultural milieu of India is quite different. The scale developed by Pareek and Chattopadhya (62), with which the author was involved, was found to be useful.

Among the techniques available for construction of scales, two are quite well known and widely used. The Thurston technique and the Likert technique have been widely used both in India and in other countries. The Thurston method is one of equally appearing intervals, a common method in psychometric testing transposed into the field of attitude measurement. In this approach, statements are anchored to specific points on the attitude continuum while the attitudinal distance between statements is theoretically equal. The procedure is as follows:

1. A large number of statements are collected.
2. Judges, at least 50 (30, p. 89), rate these statements as to scale values, usually along an eleven point scale of equal intervals.
3. Scale values are determined by an averaging of all judges' rating.
4. The more ambiguous statements are eliminated, the criterion being the discrepancy in assigned scale positions.

5. Irrelevant statements are eliminated, the criterion being the degree of statement consistency with other statements. This consistency is similar to Guttman's scalability concept.
6. Selection is made of a final list of attitude statements, usually two at each scale position, for a total of 22 items.
7. The scale is administered to the group and normative tables prepared, an individual's score or position on the attitude continuum being the median of the scale values he endorses.
8. The scale reliability and validity are determined.

Likert (47) sets forth a procedure differing radically from Thurston's equal appearing interval technique. Likert's method is one of summating ratings. The basic assumption of the method of summated rating is that each statement in the scale covers the entire attitude continuum and that an individual's overall choice of degree of acceptance or rejection determines his position on the continuum. This method is typically represented by five possible responses to each attitude statement. These responses range from strongly agree to strongly disagree. Scale value for various items are determined after a trial administration in contrast to the Thurston technique of assigning scale values by ratings before administration. The ten general steps in preparation of a Likert-type scale are:

1. Assembling a large number of statements considered to be relevant to the attitude being measured.

2. These statements are edited and revised to eliminate irrelevant and ambiguous items, rational judgment being the criterion.
3. A trial scale of statements is administered to a sample group.
4. A graphic items count of the number of subjects responding to the respective options to each statement is made for the high and low score groups.
5. Scoring weights for the alternate responses to each statement are determined by sigma-deviate weight (34), standard score weighting (72), or arbitrary unit weights (47).
6. The total trial scale is scored.
7. Item internal consistency calculations are made, i.e., item responses are correlated with total test score.
8. The non-reliable or inconsistent items are dropped from the scale, the criterion being item correlation with total score.
9. The final form of the scale is rescored.
10. Norms are prepared.

There are some advantages of each of these techniques over the other. While the Thurston and Chave (83) technique makes use of objective judgment in the selection of items, it requires a large number of items to start with, and a relatively large number of judges. Moreover, the Thurston technique is very time consuming as it requires calculation of scale values of all the items. The Likert (47) technique obviates

these difficulties. A most comprehensive comparison of the two major techniques of attitude scaling is to be found in Edwards and Kenney (28). These investigators produced Thurston- and Likert-type scales from the same universe of attitudinal statements. They have stated that the two methods are fairly comparable.

The method followed in this study was a modified form of the Likert technique, which combines the advantages of both the techniques. The present study did not follow the steps discussed with regard to the Likert type. The need of item analysis was dispensed with, and the attempt to ensure the relevancy of the items for a particular value dimension was approached through a collection of judgments of experts, a procedure adopted in Thurston's scale.

Collection of items The objective was to develop five short scales for measuring of five dimensions of general value orientation discussed earlier in the theoretical section. The definitions pertaining to each dimension were also discussed.

The post graduate students in the Division of Agricultural Extension offering psychology, rural sociology, or extension as major subjects of study were interviewed. In addition to the students several adults in different walks of life were also interviewed. It was believed that items collected from persons in urban areas might have an urban bias and might not be suitable for scales developed for measuring general value orientation of the rural people. So, 20 adult cultivators were interviewed. The main difficulty in interviewing the rural people for this purpose was that they were not sophisticated enough to conceptualize the different values. The other source of items was from available

scales (11, 30, 39, 67). The main handicap in using these items was the incompatability of most of the items with the existing cultural pattern of the community to be studied. About 250 items thus collected (from these four sources) were grouped into 10 pools of conservatism, liberalism, fatalism, scienticism, authoritarianism, non-authoritarianism, localite, cosmopolite, external conformist, and individualism on the basis of prime facie evidence of each item to belong to a particular group.

Item selection The next phase consisted of determining the relevancy of a particular item to the particular value to be measured and to reduce considerably the number of items to form a small but efficient scale and to maintain the internal consistency of the scale.

The items were properly screened and edited. The items which seemed to overlap with one another were critically examined. Either one item conveying the idea most clearly was retained or the language of an item was changed to make it suitable to express the intended sense.

Several criteria were formulated for the selection and/or rejection and editing of statements. The criteria suggested by Edwards (27) were kept in mind.

1. Avoid statements that refer to the past rather than to the present.
2. Avoid statements that may be interpreted in more than one way.
3. Avoid statements that are factual or capable of being interpreted as factual.
4. Avoid statements that are irrelevant to the psychological

object under consideration.

5. Avoid statements that are likely to be endorsed by almost every one or by almost no one.
6. Select statements that are believed to cover the entire range of the affective scale of interest.
7. Keep the language of the statements simple, clear, and direct.
8. Statements should be short, rarely exceeding 20 words.
9. Each statement should contain only one complete thought.
10. Statements containing universals such as all, always, none, and never often introduce ambiguity and should be avoided.
11. Words such as only, just, and merely, and others of a similar nature should be used with care and moderation in writing statements.
12. Whenever possible, statements should be in the form of simple sentences rather than in the form of compound or complex sentences.
13. Avoid the use of words that may not be understood by those who are to be given the scale.
14. Avoid the use of double negatives.

Considering the above criteria a total of 125 items were retained maintaining a more or less equitable proportion from each of the 10 groups. The list of 125 items was sent to 75 judges to determine the relevancy of each item to a particular value dimension. The judges

were psychologists, sociologists, and anthropologists in different universities and institutions in India.

After the responses were obtained from the judges, the responses were summarized for each item. Those items which did not receive any judgment were interpreted as not belonging to any of the ten values. For each item the number of responses in each of the 10 categories and the total response from the 10 categories were calculated. The criterion of selection for items was that it should have received eighty per cent unanimity out of the total responses it received. In each category those items which received eighty per cent or more of unanimity were selected. The unanimity of the judges about the items belonging to a scale was taken to be an indicator of the internal consistency of the scale.

In the final construction of the five scales the conservatism - liberalism (C-L scale), the fatalism - scienticism (F-S scale), the authoritarianism - non-authoritarianism (A-N scale), the localite - cosmopolite (Lo-Co scale), and the external conformity - individualism (E-I scale) five items for each scale were finally selected. Selected items appear in Appendix B.

The scale It may be observed from the scale that three of the 5 items in the C-L scale are negative items of conservatism. A strong agreement with any one of the three items of the C-L scale would indicate strong conservatism and a strong disagreement would denote liberalism. Just the opposite was the case for the two positive items.

The items in the F-S scale were also bipolarized. A strong agreement with three negative items would indicate fatalism and vice versa. The strong agreement with the other two positive items indicate

scienticism and vice versa.

In the A-N scale strong agreement with four of the negative items would indicate authoritarianism and one positive item would indicate non-authoritarianism.

In the Lo-Co scale, strong agreement with the three negative items would indicate localite and strong agreement with the two positive items would indicate cosmopolite.

In the case of E-I, strong agreement with the three negative items would indicate external conformity and strong agreement with the two positive items would indicate individualism.

Following is an example of scoring technique used for the 5 scales pertaining to general value orientation.

For positive items

Response:	Strongly agree 4	Agree 3	Disagree 2	Strongly disagree 1
Value:	1	2	3	4

For negative items

Response:	Strongly agree 4	Agree 3	Disagree 2	Strongly disagree 1
Value	4	3	2	1

The scales developed for the measurement of 5 dimensions of general value orientation were 4-point scales, having four categories of responses: Strongly agree, agree, disagree, and strongly disagree. It is customary to incorporate a middle category of "undecided" indicating that the subject was undecided or that the others did not pertain to him. The middle category also may serve as a defense outlet for an unwilling

respondent who wants to escape the rigours of judging the items. It was believed the elimination of this category would introduce some sort of persuation to respond to each item. This was done on the assumption that the five value dimensions that were studied were "a priori" considered to be most general in nature and each one of the items was relevant to the cultivators.

The criterion of scoring was unidirectional. High scores in C-L scale, F-S scale, A-N scale, Lo-Co scale and E-I scale indicated high degree of conservatism, fatalism, authoritarianism, localite and external conformity.

Validity of the scales No validity studies were made for the five dimensions of general value orientation scales. However an attempt was made to obtain validity in the process of the preparation of the scales. Some experts were used as judges for rating the statements for their relevance to various value dimensions. The criterion for the selection of the statements was the unanimity of judges (at least 80 per cent).

Pretest The scale was pretested before administering it to an actual sample of the study. The pretesting showed that some changes were necessary in the wording of the statements to improve communication.

On the basis of the above discussion, further epistemic correlations were developed.

E.C. 8: Higher score on C-L (conservatism - liberalism) scale is a measure of conservatism and a lower score is a measure of liberalism.

E.C. 9: Higher score on F-S (fatalism - scienticism) scale is a measure of fatalism and lower score is a measure of scienticism.

E.C. 10: Higher score on A-N (authoritarianism - non-authoritarianism) scale is a measure of authoritarianism and the lower is a measure of non-authoritarianism.

E.C. 11: Higher score on Lo-Co (localite - cosmopolite) scale is a measure of localite and lower score is a measure of cosmopolite.

E.C. 12. Higher score on E-I (external conformity - individualism) scale is a measure of external conformity and lower score is a measure of individualism.

Empirical hypotheses for the sub-hypotheses 1-1-1 to 1-1-5 derived from sub-general hypothesis 1-1 can now be constructed using the data from epistemic correlations 1 and 2, and then from 8 - 12.

E.H. 1: The score on C-L (conservatism - liberalism) scale will vary, inversely with the adoption quotient score.

E.H. 2: The score on F-S (fatalism - scienticism) scale will vary inversely with the adoption quotient score.

E.H. 3: The score on A-N (authoritarianism - non-authoritarianism) scale will vary inversely with the adoption quotient score.

E.H. 4: The score on Lo-Co (localite - cosmopolite) scale will vary inversely with the adoption quotient score.

E.H. 5: The score on E-I (external conformity - individualism) scale will vary inversely with the adoption quotient score.

The frequency distributions of the scores on the five scales of general value orientation of cultivators are shown in Tables 5, 6, 7, 8, and 9 in Appendix A.

Occupational value orientation scales The development of the quantitative measurement of occupational value orientation was a difficult task. Very few studies of this type have been made. The modified form of paired comparison technique was used to determine each cultivator's occupational value orientation.

Collection of statements Items indicating occupational values were collected from various sources.

1. Survey of literature: The various types of literature including books, journals and bulletins proporting to deal with the concepts and measurements of occupational value were studied. But no suitable items were found.
2. Pilot study: A number of villages in the Khanjawala Block were visited. The purpose of the study was first explained to cultivators and then the question was put to them, "Why do you favor farming as an occupation?" During the conversation they started reacting, expressing their opinions and narrating their experiences. This provided an opportunity to note their reactions and to collect items. For this purpose 60 cultivators chosen at random were interviewed individually.

As there was a lack of suitable items from the existing materials,

the first source was found to be of no help. The main source of items was the pilot study.

Item selection After collection of statements relating to occupational values, the next step was preliminary selection of a list of items. This was done to retain the more essential statements and to eliminate those which were of lesser importance. The criteria to be used in this preliminary selection were the same as discussed earlier in relation to the item selection of general value orientation. On the basis of the criteria some items were discarded from the original list of statements. For example, the statement by the farmer that he favored farming because there was a lack of other alternative occupations was not included for two reasons: one, it did not indicate any particular value, and two, it was a very general reply given by almost all the cultivators.

The abridged list thus prepared consisted of 15 statements. The 15 statements obtained were presented to 10 judges, consisting of specialists and extension personnel, who helped to determine what occupational value each statement represented. On the summarization of the results, it was found that only eight statements were clearly indicative of social values while the others were less precise or ambiguous according to the judges. Statements which failed to obtain 80 per cent of unanimity among the judges were discarded. The following is a list of statements finally selected by the judges with the value each one represents. This process of judges' opinion was taken to be an indicator of the internal consistency and validity of items.

Statements	Value that each represents
1. In this occupation (farming) investment is less and we get more	Economic
2. In this occupation (farming) less work, more free time	Leisure
3. In this occupation (farming) more opportunity to try out innovations	Scienticism
4. In this occupation (farming) opportunity to live with family	Familism
5. In this occupation (farming) there is less risk	Security
6. In this occupation (farming) there is freedom to do work	Freedom
7. This occupation (farming) is handed down from generation to generation	Tradition
8. In this occupation (farming) opportunity to do hard work	Hard work

The scale The modified form of paired comparison technique was used to study the eight occupation-value orientations of cultivators. The method of paired comparison made it possible to compare each statement with every other and in turn helped to determine the frequency by which each item was selected by each respondent in comparison to other items. Since there were eight statements, each representing a value, 28 pairs were necessary as per the formula $\frac{n(n-1)}{2} = \frac{8(8-1)}{2} = 28$ where n = total number of statements.

Twenty-eight cards of postcard-size were prepared and on each card two statements of occupational values were written in boldface in the local language[1]. Each statement was presented against every other statement.

[1]These statements as they appeared on each card, have been translated into English and are given in Appendix B.

The 28 pairs or combinations were administered to each of the 175 sample cultivators. As the sample cultivators were mostly illiterate the statements were read out to each respondent and he was asked to agree with, out of each pair, the one statement which he thought was the most favorable toward farming. Through this process, it was possible to determine the frequencies with which each cultivator had chosen each of these eight statements.

In order to score each cultivator on the basis of his frequency of selection of items, it was decided to have all of the eight statements ranked by a panel of judges. The judges were seven Ph.D. students at Iowa State University, who were fully acquainted with the farming occupation. They were asked to rank these statements (values) on the basis of their relationship to proneness to change. Through this process of judges' ranking, a final rank order was obtained from 1 to 8, number 8 statement being most prone toward change and 1 being the least.

The actual frequency of each cultivator for each item was then multiplied with the respective ranking of judges for the item. Through this process the value position of each farmer with respect to change proneness was obtained.

E.C. 13: The frequency with which the statement "This occupation (farming) is handed down from generation to generation" is selected and then multiplied with its respective ranking (2) is a measure of the degree of traditionalism value orientation.

E.C. 14: The frequency with which the statement "In this occupation (farming), opportunity to live with

family" is selected and then multiplied with its respective ranking (3) is a measure of the degree of familism value orientation.

E.C. 15: The frequency with which the statement "In this occupation (farming), opportunity to do hard work" is selected and then multiplied with its respective ranking (4) is a measure of the degree of hard work value orientation.

E.C. 16: The frequency with which the statement "In this occupation (farming), there is freedom to do work" is selected and then multiplied with its respective ranking (6) is a measure of the degree of freedom value orientation.

E.C. 17: The frequency with which the statement "In this occupation (farming), investment is less and we get more" is selected and then multiplied with its respective ranking (7) is a measure of the degree of economic value orientation.

E.C. 18: The frequency with which the statement "In this occupation (farming), more opportunity to try out innovations" is selected and then multiplied with its respective ranking (8) is a measure of the degree of scienticism value orientation.

E.C. 19: The frequency with which the statement "In this occupation (farming), less work more free time" is selected and then multiplied with its respective

ranking (1) is a measure of the degree of leisure value orientation.

E.C. 20: The frequency with which the statement "In this occupation (farming) there is less risk" is selected and then multiplied with its respective ranking (5) is a measure of the degree of security value orientation.

Empirical hypotheses for the sub-hypotheses 1-2-1 to 1-2-8 belonging to sub-general hypothesis 1-2 can now be constructed by using data from epistemic correlations 1 and 2 and those from 13 - 20.

E.H. 6: The score on traditionalism will vary inversely with the adoption quotient score.

E.H. 7: The score on familism will vary inversely with the adoption quotient score.

E.H. 8: The score on hard work will vary inversely with the adoption quotient score.

E.H. 9: The score on freedom will vary directly with the adoption quotient score.

E.H. 10: The score on economic will vary directly with the adoption quotient score.

E.H. 11: The score on scienticism will vary directly with the adoption quotient score.

E.H. 12: The score on leisure will vary directly with the adoption quotient score.

E.H. 13: The score on security will vary directly with the adoption quotient score.

Sampling and Field Procedure

Sample

Khanjawala Community Development Block consisted of 56 villages, and the cultivators in these villages are the population of this study. The sample design was a stratified proportional random sample. The entire Block was stratified into 9 zones of 6 to 7 contiguous villages with approximately 2500 households in each zone. The criteria for the division of the zones were the homogeneity of the area delineated as to their soil condition, irrigation facilities and the type of crops grown.

From each group one village was selected at random. All the cultivator families in each of the selected villages were stratified into four groups on the basis of land ownership. The four groups were 5 acres and below, between 6 - 10 acres, between 11 - 15 acres, and 16 acres and above. From each of these groups 20 per cent of the cultivator families were selected at random. The total sample available for this study was 175 cultivators.

Field procedure

The general procedure used to collect the data consisted of personal, individual interviews. In some cases instructions were given in a group, followed by interviewing the respondents individually. As respondents were mostly illiterate, the interviewer had to read the items to them in their local language. The order of presentation was as follows: measurement of adoption, general value orientation and occupational value orientation.

Interviews with the cultivators were conducted during 1962-1963. On the average the interviews required 2 to 3 hours. Interviews were conducted during the leisure time of the cultivators. The interviewing was done partly by the author and partly by the field staff of the Agricultural Extension Division. It was necessary for the cultivators to recall various information for certain questions. The recall period was as long as ten years for certain questions. At the beginning there was doubt whether the cultivators would be able to recall events as far back as ten years. However, early interviewing experiences showed that they could. Since cultivation was their main occupation, they apparently could remember the information sought. In many cases, it was necessary to probe. Inter-connections of the network of various events generally helped to trace back to the past events. Some reference points were usually supplied by the interviewers. They were readily accepted as stable anchoring points in remembering events. Some of these were important socio-political events such as Independence Day, general elections, religious ceremonies, some important acts and bills, and opening of the Community Development Block. With the help of these and other varying anchoring points the responses appeared to be quite accurate.

It was later found that Rogers (71) also used the same procedure. He reported that,

> Educational psychologists advised the author that farmers could probably recall adoption dates for about ten years. The experience of field interviews generally support this expectation. However on several occasions sensitive probing was required to secure adoption dates... By connecting adoption dates with other well-remembered events, such as

> when a son went to college, most respondents were more able to provide fairly good data as to data of adoption of the 25 new practices. (71, pp. 57-58)

For measurement of general value orientation, a respondent was informed that he would be told a few statements[1]. On hearing each statement, he was to decide whether he agreed with the statement or disagreed. If he disagreed, then whether he simply disagreed or strongly disagreed. If he agreed, then also whether he simply agreed or strongly agreed. Then each statement from the inventory was read out to him and the responses were obtained.

For measurement of occupational value orientation, a respondent was interviewed with the help of 28 cards. Each card contained pairs of statements on it. The respondent was informed that he would be presented with 28 cards, one at a time, and the two statements would be read to him. On hearing the two statements he was to agree with what he thought was the most favorable statement toward farming. In order to record the frequency of such responses thus obtained a special scoring sheet was developed (see Appendix B).

Statistical Measure

The statistical techniques which are used to test the various empirical hypotheses include zero-order personian correlation coefficient and multiple regression. Multiple regression is also used to determine the degree to which the dependent variable, adoption quotient

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[1]Statements are given in Appendix B. The general value orientation scale.

measuring the concept adoption behavior, could be predicted with the 18 independent variables[1]. These two tests are discussed in the following chapters--Analysis of Data and Additional Analysis.

The level of probability which will be considered as an acceptable indicator of a statistically significant relationship for the correlation analysis is at the .01 level of probability for a one-tailed test. The level of probability which will be considered as statistically significant for multiple regression is the .025 level of probability. The assumption made in using the parametric statistics are normality, homogeneity of variance, independence, randomness, and the error uncorrelated and normally distributed. It may be pointed out that data which are obtained in behavioral science research do not always conform to these assumptions. Measurement errors often occur and are difficult to estimate. However, the attempts were made through sampling procedure followed in this study to attain independence and randomness.

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[1]The list of independent variables includes 13 socio-psychological variables and 5 situational variables for the purpose of multiple regression analysis.

ANALYSIS OF DATA

Zero-Order Correlation

The first step in testing the two sub-general hypotheses is to determine the zero-order intercorrelation between the thirteen independent variables and the one dependent variable.

In the previous chapter, thirteen empirical hypotheses have been stated. In the discussion which follows general hypothesis 1 along with its two sub-general hypotheses will be stated, followed by the corresponding sub and empirical hypotheses used to test the following theoretical hypothesis.

Theoretical hypothesis: Adoption behavior of cultivators will vary with and can be in part predicted from the type and level of value orientation that they possess.

General hypothesis 1

The cultivators possessing more of the value orientations associated with folk type will exhibit a lesser degree of adoption behavior.

Sub-general hypothesis 1-1 The cultivators possessing more of the value orientations associated with general value orientations of folk type will exhibit a lesser degree of adoption behavior.

Sub-hypothesis 1-1-1 There will be a negative relationship between conservatism value orientation and adoption behavior.

E.H. 1: The score on C-L (conservatism - liberalism) scale will vary inversely with the adoption quotient score. The hypothesis stated in the null form is: There is

no inverse relationship between the score on the C-L scale and the score on the adoption quotient. The computed coefficient of correlation is -0.7066 which is statistically significant at the .01 level of probability for a one-tailed test. The null hypothesis is refuted. These data support the original proposition.

Sub-hypothesis 1-1-2 There will be a negative relationship between fatalism value orientation and adoption behavior.

E.H. 2: The score on F-S (fatalism - scienticism) scale will vary inversely with the adoption quotient score. The hypothesis stated in the null form is: There is no inverse relationship between the score on the F-S scale and the score on the adoption quotient. The computed coefficient of correlation is -0.7435 which is significant at the .01 level of probability for a one-tailed test. The null hypothesis is refuted. These data support the original proposition.

Sub-hypothesis 1-1-3 There will be a negative relationship between authoritarianism value orientation and adoption behavior.

E.H. 3: The score on A-N (authoritarianism - non-authoritarianism) scale will vary inversely with the adoption quotient score. This hypothesis stated in the null form is: There is no inverse relationship between the score on the A-N and the score on the adoption quotient. The computed coefficient of correlation is 0.7373 which is not significant at the .01 level

of probability for a one-tailed test. If a two-tailed test had been used this value would have been significant but not in the hypothesized direction. The null hypothesis is not refuted. These data do not support the original proposition.

Sub-hypothesis 1-1-4 There will be a negative relationship between localite value orientation and adoption behavior.

E.H. 4: The score on Lo-Co (localite - cosmopolite) scale will vary inversely with the adoption quotient score. The hypothesis stated in the null form is: There is no inverse relationship between the score on the Lo-Co and the score on the adoption quotient. The computed coefficient of correlation is -0.6465 which is significant at the .01 level of probability for a one-tailed test. The null hypothesis is refuted. These data support the original proposition.

Sub-hypothesis 1-1-5 There will be a negative relationship between external conformity value orientation and adoption behavior.

E.H. 5: The score on E-I (external conformity - individualism) scale will vary inversely with the adoption quotient score. This hypothesis stated in the null form is: There is no inverse relationship between the score on the E-I scale and the score on the adoption quotient. The computed coefficient of correlation is 0.6813 which is not significant at the .01 level of probability for a one-tailed test. If a two-tailed test

had been used this value would have been significant but not in the hypothesized direction. The null hypothesis is not refuted. These data do not support the original proposition.

Sub-general hypothesis 1-2 The cultivators with a greater degree of occupational value orientation of folk type will exhibit a lesser degree of adoption behavior.

Sub-hypothesis 1-2-1 There will be a negative relationship between traditionalism orientation and adoption behavior.

E.H. 6: The score on traditionalism will vary inversely with the adoption quotient score. The hypothesis stated in the null form is: The score on traditionalism orientation will vary directly with the adoption quotient score. The computed coefficient of correlation is -0.7956 which is significant at the .01 level of probability for a one-tailed test. The null hypothesis is refuted. These data support the original proposition.

Sub-hypothesis 1-2-2 There will be a negative relationship between familism value orientation and adoption behavior.

E.H. 7: The score on familism will vary inversely with the adoption quotient score. This hypothesis stated in the null form is: The score on familism orientation will vary directly with adoption quotient score. The computed coefficient of correlation is -0.7585

which is significant at the .01 level of probability for a one-tailed test. The hypothesis is refuted. These data support the original proposition.

Sub-hypothesis 1-2-3 There will be a negative relationship between hard work value orientation and adoption behavior.

E.H. 8: The score on hard work will vary inversely with the adoption quotient score. This hypothesis stated in null form is: The score on hard work orientation will vary directly with the adoption quotient score. The computed coefficient of correlation is -0.0907 which is not significant at the .01 level of probability for a one-tailed test. The null hypothesis is not refuted. These data do not support the original proposition.

Sub-hypothesis 1-2-4 There will be a positive relationship between freedom value orientation and adoption behavior.

E.H. 9: The score on freedom will vary directly with the adoption quotient score. The hypothesis stated in null form is: The score on freedom orientation will not vary directly with the adoption quotient score. The computed coefficient of correlation is 0.6517 which is significant at the .01 level of probability for a one-tailed test. The null hypothesis is refuted. These data support the original proposition.

Sub-hypothesis 1-2-5 There will be a positive relationship between economic value orientation and adoption behavior.

E.H. 10: The score on economic will vary directly with the adoption quotient score. This hypothesis stated in the null form is: The score on economic orientation will not vary directly with the adoption quotient score. The computed coefficient of correlation is 0.8171 which is significant at the .01 level of probability for a one-tailed test. The null hypothesis is refuted. These data support the original proposition.

Sub-hypothesis 1-2-6 There will be a positive relationship between scienticism value orientation and adoption behavior.

E.H. 11: The score on scienticism will vary directly with the adoption quotient score. This hypothesis stated in the null form is: The score on scienticism orientation will not vary directly with the adoption quotient score. The computed coefficient of correlation is 0.6824 which is significant at the .01 level of probability for a one-tailed test. The null hypothesis is refuted. These data support the original proposition.

Sub-hypothesis 1-2-7 There will be a positive relationship between leisure value orientation and adoption behavior.

E.H. 13: The score on leisure will vary directly with the adoption quotient score. The hypothesis stated

in the null form is: The score on leisure orientation will not vary directly with the adoption quotient score. The computed coefficient of correlation is -0.5755 which is not significant at the .01 level of probability for a one-tailed test. If a two-tailed test had been used this value would have been significant but not in the hypothesized direction. The null hypothesis is not refuted. These data do not support the original proposition.

Sub-hypothesis 1-2-8 There will be a positive relationship between security value orientation and adoption behavior.

E.H. 12: The score on security will vary directly with the adoption quotient score. This hypothesis stated in the null form is: The score on security orientation will not vary directly with the adoption quotient score. The computed coefficient of correlation is 0.6723 which is significant at the .01 level of probability for a one-tailed test. The null hypothesis is refuted. These data support the original proposition.

ADDITIONAL ANALYSIS

In this chapter, some additional points pertaining to the research objectives will be discussed. The chapter includes three sections. The first section will deal with personal and situational variables as was proposed in the theory chapter. The second section will deal with research objectives 4 and 5. A conceptual analysis of value orientation and some personal and situational variables will be examined through regression analysis in order to determine their contribution in explaining the variation in adoption behavior. The final section of this chapter will deal with the hierarchical pattern of occupational value orientations as proposed in research objective 2 in the introduction of this dissertation.

Personal and Situational Variables

It was proposed in the theory chapter of this dissertation that certain personal and situational variables may influence the relationship between value orientation and behavior. Some selected personal variables, education and membership; and some selected situational variables, family size, land size, and irrigational facilities will be examined to determine the relationship between certain of the value orientations--general and occupational--and adoption behavior.

There is little doubt that different individuals face different social and physical constraints when they enter into social action. The literature suggests (20, 21) that social and physical constraints should be considered since they are expected to influence the magnitude

of the relationship between value orientations and behavior.

A brief discussion on situational and personal variables will be given in terms of their empirical measurement and extent of relationship between each and adoption behavior. In the next section, these variables will be included with other value orientation variables in the regression analysis to determine if they make contributions in explaining the variation in adoption behavior.

Education:	Measurement	Score given
	Middle class and above	3
	Between middle class and primary	2
	Below primary class	1
	Illiterate	0

By using the above measurement the cultivators were classified and the distribution was as follows:

	No. of cultivators	Percentage
Middle class and above	15	8 per cent
Between middle class and primary class	21	12 per cent
Below primary class	0	-
Illiterate	139	80 per cent
	175	

The computed coefficient of correlation between education and adoption behavior is 0.0413 which is not significant at the .01 level of probability.

Land size:	Measurement	Score given
	16 acres and above	4
	Between 11 - 15 acres	3
	Between 6 - 10 acres	2
	Below 5 acres	1

By using the above measurement the cultivators were classified and the distribution was as follows:

	No. of cultivators	Percentage
16 acres and above	28	16 per cent
between 11 - 15 acres	25	14 per cent
Between 6 - 10 acres	55	32 per cent
Below 5 acres	67	38 per cent
	175	

The computed coefficient of correlation between land size and adoption behavior is 0.0224 which is not significant at the.01 level of probability.

Irrigation facilities:	Measurement	Score given
	Fully irrigated land	4
	More than half irrigated land	3
	Half irrigated land	2
	Less than half irrigated land	1
	No irrigated land	0

By using the above measurement the cultivators were classified and the distribution was as follows:

	No. of cultivators	Percentage
Fully irrigated land	122	70 per cent
More than half irrigated land	42	25 per cent
Half irrigated land	5	2 per cent
Less than half irrigated land	6	3 per cent
	175	

The computed coefficient of correlation between irrigated land and adoption behavior is .0368 which is not significant at the .01 level of probability.

Family size: Measurement	Score given
20 members and above	5
15 - 19 members	4
11 - 14 members	3
6 - 10 members	2
1 - 5 members	1

By using the above measurement the cultivators were classified and the distribution was as follows:

	No. of families	Percentage
20 members and above	22	13 per cent
15 - 19 members	26	15 per cent
11 - 14 members	21	12 per cent
6 - 10 members	69	39 per cent
1 - 5 members	37	21 per cent
	175	

The computed coefficient of correlation between family size and adoption behavior is .0385 which is not significant at the .01 level

of probability.

Membership:	Measurement	Score given
	Members of any organization	1
	Not members of any organization	0

By using the above measurement the cultivators were classified and the distribution was as follows:

	No. of cultivators	Percentage
Membership of any organization	61	34 per cent
No membership of any organization	114	66 per cent
	175	

The computed coefficient of correlation between membership and adoption behavior is .4742 which is significant at the .01 level of probability.

The zero-order correlation table (Table 15 in Appendix A) indicates that only one (membership), personal variable, appeared to have a significant relationship (.4742 at .01 level) with adoption. The analysis of coefficient of correlation was done on "non-directional" and exploratory basis.

Regression Analysis

One of the purposes of this dissertation is to determine the extent to which the adoption behavior can be predicted or explained in part from a conceptual variable analysis of the eighteen independent variables.[1] It will be the purpose of this section to combine all the

[1]This includes 13 value orientation variables and 5 personal and situational variables. The variables education and membership in local organizations are personal variables and land size, irrigation, and family size are situational variables.

eighteen independent variables in an attempt to determine if a significant amount of the variation in adoption behavior can be explained. The statistical technique of multiple regression will be utilized for this purpose.

The symbols used to denote each of the variables under consideration in this part of the analysis are as follows:

Dependent: Y = adoption behavior

Independent: X_1 = education

X_2 = land size

X_3 = irrigation

X_4 = family size

X_5 = membership in local organizations

X_6 = fatalism - scienticism

X_7 = conservatism - liberalism

X_8 = Authoritarianism - non-authoritarianism

X_9 = localite - cosmopolite

X_{10} = external conformity - individualism

X_{11} = economic

X_{12} = leisure

X_{13} = scienticism

X_{14} = familism

X_{15} = security

X_{16} = freedom

X_{17} = traditionalism

X_{18} = hard work.

A regression equation will be computed whereby an estimate of adoption behavior may be made by selected appropriate values of X_1, X_2 ..., X_{18} in the general formula.

$$Y = \alpha + b_1X_1 + b_2X_2 + \ldots + b_{18}X_{18} + \varepsilon \ .$$

The assumptions made here are, 1) that the X's are fixed variates and may be looked upon as population parameters, 2) that a fixed set of X's, the Y's associated with this set, are normally independently distributed, and 3) that for any set of X's, the variance of Y shall be the same.

There is no unique statistical procedure for selecting the best regression equation. Personal judgement will be a necessary part of any statistical method. Draper and Smith (23) discussed five procedures for selecting the best regression equation: 1) all possible regressions, 2) backward elimination, 3) forward selection, 4) step-wise regression, and 5) stage-wise regression. For practical reasons, they prefer step-wise procedure. The other methods, according to them, are of less value, but each has its use in special cases.

Step-wise regression is used in the data analysis in this thesis in order to find out the best predictors out of 18 independent variables. The selection of independent variables out of these 18 independent variables for regression equation was not possible on the basis of usual criterion used for selection because of very high intercorrelations among the independent variables, thus requiring more than just the statistical screening process used in ordinary cases. Draper and Smith

(23) suggest the step-wise regression to be used under this kind of problematic situation.

The step-wise regression analysis examines at every stage of the regression the variables incorporated into the model in a particular order. A variable which may have been the best single variable to enter at an early stage may at a later stage be superfluous because of the relationship between it and other variables added into the regression model. Any variable which provides a non-significant contribution is removed from the model. This process is continued until no more variables will be admitted to the equation at a stated level. Draper and Smith (23) believe this to be the best of the variable selection procedures and recommend its use.

The following procedures of step-wise regression are given as described by Draper and Smith. Examples out of the data pertaining to this disseration are used.

Step 1: The step-wise procedure starts with the simple correlation matrix and enters into regression the X variables most highly correlated with the response Y (measurement of dependent variable).

In terms of the data of this study variable X_{11} is entered first into the model.

Step 2: Using the partial correlation coefficients it now selects, as the next variable to enter regression, that X variable whose partial correlation with the response is highest.

In relation to these data, variable X_6 enters second into the model.

Step 3: Given the regression equation $\hat{Y} = f(X_{11}X_6)$, the method now examines the contribution X_{11} would have made if X_6 had been entered first and X_{11} entered second. If the value of the partial F is significant at a given level then the variable X_{11} is retained. The step-wise method now selects the next variable to enter, the one most highly partially correlated with the response, given that variables X_{11} and X_6 are already in regression.

In relation to these data variable X_{17} entered third into the model.

Step 4: A regression equation of form $\hat{Y} = f(X_{11}X_6X_{17})$ is now determined by least squares. The variable X_{17} remains in the model if it has a significant F value.

In relation to these data, the above process continued until no additional variable is admitted to the equation based on the stipulated criterion.

Step 5: Derivation of final variables for best regression equation.

In relation to these data, the variables X_{11}, X_6, X_{17}, X_{15}, X_{14}, and X_8 were finally selected for the regression equation.

To determine significance contribution of each selected independent variable in explaining the variance of dependent variable, F tests are used. These F ratios will assess the significance of the additional reductions in the residual sum of squares achieved by fitting the b's

in the particular order decided by the step-wise regression analysis. Ostle (61) points out that the order of fitting the coefficients has effect on the analysis. In this dissertation, the order of selecting these 6 independent variables for regression equation was determined by the process of step-wise regression. Draper and Smith (23) have given the justification for such selection as already mentioned.

The symbols used to denote each corresponding coefficient value of the six independent variables thus selected through the process of step-wise regression in this part of the analysis are as follows:

Variable selected		Corresponding coefficient[1]
X_{11}	Economic orientation	b_1
X_6	Fatalism - scienticism orientation	b_2
X_{17}	Traditionalism - orientation	b_3
X_{15}	Security orientation	b_4
X_{14}	Familism orientation	b_5
X_8	Authoritarian - non-authoritarianism orientation	b_6

In the present context, the sum of squares associated with various coefficients are obtained in a definite (sequential) order. The sum of squares due to b_1 is found first. After finding the sum of squares due to b_1, the sum of squares due to b_2 is found; hence the symbolism b_2/ b_1, which is read "b_2 given that b_1 has been determined." The next sum of

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[1] In order to facilitate better communication, corresponding coefficients are numbered in the order in which step-wise regression selected them, namely, b_1 was selected first and b_6 last.

squares recorded is that due to b_3/b_1b_2 which means that b_3 was found after b_1 and b_2 have been determined. The remaining symbols in Table 2 may be explained in a similar manner.

Table 2. Analysis of variance associated with step-wise regression

Source of variation	Degree of freedom	Sum of squares	Mean square	F ratio
Due to b_1	1	21,658.505	21,658.505	515.864[a]
Due to b_2/b_1	1	2,166.145	2,166.145	51.593[a]
Due to b_3/b_1b_2	1	825.537	825.537	19.663[a]
Due to $b_4/b_1, b_2, b_3$	1	342,803	342.803	8.165[b]
Due to $b_5/b_1, b_2, b_3, b_4$	1	296.021	296.021	7.051[b]
Due to $b_6/b_1, b_2, b_3, b_4, b_5$	1	199.961	199.961	4.763[b]
Due to b_7-b_{18}/b_1-b_6	12	394.978	- 32.915	.784
Due to overall regression	18	25,893.049	1,438.502	34.26[a]
Residual	156	6,549.671	41.985	
	192			

[a]Highly significant at .025 level of probability.

[b]Significant at .025 level of probability.

To test the hypotheses that the inclusion of the additional variable makes a significant difference in accounting for variation in adoption behavior the formula given by Ostle (61, p. 187) is used.

$$F = \frac{\text{mean square due to } b_i/b_o, b_1, \ldots b_i\text{-}1}{\text{residual mean square}}.$$

By using the procedure discussed above various hypotheses associated with the regression function are tested.

The variables contributing most in explaining the variation in the criterion variables are six. Although the remaining variables may contribute in explaining the variation in the criterion variable such contribution was found to be not significant at a given level of .025 probability. The following table is presented to indicate the R^2 for each six variables selected through step-wise regression.

Table 3. Additions to multiple correlation coefficient associated with step-wise regression

Variables		R^2
X_{11}	Economic orientation	.668
X_6	Fatalism - scienticism orientation	.066
X_{17}	Traditionalism orientation	.025
X_{15}	Security orientation	.010
X_{14}	Familism orientation	.009
X_8	Authoritarianism - non-authoritarianism orientation	.006
		.784

General hypothesis 2

Adoption behavior of cultivators can be in part predicted from the type and level of value orientation that they possess taking into account situation and personal variables.

Sub-general hypothesis 2-1 Type and level of value orientation possessed by cultivators will explain a significant amount of variation in adoption behavior or can be used to predict in part adoption behavior taking into account the amount of variation "explained" by situational and personal factors.

Sub-hypothesis 2-1-1 All the eighteen variables contribute to the explanation of the variance of adoption behavior.

E.H. 14: The score on the eighteen variables will explain a significant amount of the variance in adoption quotient. The statistical hypothesis stated in the null form is: The additional sum of squares for regression added by the variables X_1 through X_{18} is zero. The computed F-ratio is 34.26 with 18 and 156 degrees of freedom which is significant at the .01 level of probability. The null hypothesis is refuted. The data support the original proposition.

The above test indicates that all the eighteen variables taken together explain a highly significant amount of the variance in adoption behavior. The problem then becomes which ones makes the greater contribution. The step-wise regression analysis determined the six variables out of eighteen on the basis of their individual contribution. Now the next hypothesis is stated to find out what happens when the six variables are taken out of the eighteen variables.

Sub-hypothesis 2-1-2 The variables education, land size, irrigation, family size, membership, conservatism, localite, external

conformity, leisure, scienticism, freedom and hard work contribute to the explanation of the variance of adoption behavior.

E.H. 15: The score on variables education, land size, irrigation, family size, membership, conservatism, localite, external conformity, leisure, scienticism, freedom and hard work will explain a significant amount of the variance in the score on adoption quotient. The statistical hypothesis stated in the null form is: The additional sum of squares for regression added by the variables X_1, X_2, X_3, X_4, X_5, X_7, X_9, X_{10}, X_{12}, X_{13}, X_{16}, and X_{18} after variables X_{11}, X_6, X_{17}, X_{15}, X_{14}, and X_8 is zero. The computed F-ratio is .784 with 12 and 156 degrees of freedom which is not significant at the .01 level of probability. The null hypothesis is not refuted. The data do not support the original proposition.

The result shows the additional sum of squares for regression added by the variables was not significant at a given F level once the sum of squares due to 6 variables (selected through step-wise regression) were taken out. Now additional six sub-hypotheses are needed to test these six independent variables for their individual contribution, based on the fact that all six variables are included in the multiple regression analysis. As pointed out earlier, the following hypothesis will be tested in the order determined by the step-wise multiple regression analysis.

Sub-hypothesis 2-1-3 The economic orientation (X_{11}) contributes to the explanation of the variance of adoption behavior.

E.H. 16: The scores on economic orientation will explain a significant amount of the variance in the score on adoption quotient. The statistical hypothesis stated in the null form is: The sum of squares for regression of variable X_{11} is zero. The computed F-ratio is 515.864 with 1 and 156 degrees of freedom which is significant at the .025 level of probability. The null hypothesis is refuted. The data support the original proposition.

Sub-hypothesis 2-1-4 The fatalism orientation (X_6) contributes to the explanation of the variance of adoption behavior.

E.H. 17: The score on fatalism - scienticism scale will explain a significant amount of the variance in the score on adoption quotient. The statistical hypothesis stated in the null form is: The additional sum of squares for regression added by the variable X_6 (fatalism - scienticism) after variable X_{11} (economic orientation) is zero. The computed F-ratio is 51.593 with 1 and 156 degrees of freedom which is highly significant at the .025 level of probability. The null hypothesis is refuted. The data support the original proposition.

Sub-hypothesis 2-1-5 The traditionalism orientation (X_{17}) contributes to the explanation of the variance of adoption behavior.

E.H. 18: The score of traditionalism orientation will explain a significant amount of the variance in the score on adoption quotient. The statistical hypothesis stated in the null form is: The additional sum of squares for regression added by the variable X_{17}

(traditionalism) after variables X_{11} (economic orientation) and X_6 (fatalism - scienticism) is equal to zero. The computed F-ratio is 19.663 with 1 and 156 degrees of freedom which is highly significant at the .025 level of probability. The null hypothesis is refuted. The data support the original proposition.

Sub-hypothesis 2-1-6 The security orientation (X_{15}) contributes to the explanation of the variance of adoption behavior.

E.H. 19: The score on security orientation will explain a significant amount of the variance in the score on adoption quotient. The statistical hypothesis stated in the null form is: The additional sum of squares for regression added by the variable X_{15} (security) after variables X_{11} (economic), X_6 (fatalism - scienticism, and X_{17} (traditionalism) is zero. The computed F-ratio is 8.165 with 1 and 156 degrees of freedom which is significant at the .025 level of probability. The null hypothesis is refuted. The data support the original proposition.

Sub-hypothesis 2-1-7 The familism orientation (X_{14}) contributes to the explanation of the variance of adoption behavior.

E.H. 20: The score on familism orientation will explain a significant amount of the variance in score on adoption quotient. The statistical hypothesis

stated in the null form is: The additional sum of squares for regression added by the variable X_{14} after the variable X_{11} (economic), X_6 (fatalism - scienticism), X_{17} (traditionalism) and X_{15} (security) is zero. The computed F-ratio is 7.051 with 1 and 156 degrees of freedom which is significant at the .025 level of probability. The null hypothesis is refuted. The data support the original proposition.

Sub-hypothesis 2-1-8 The authoritarianism orientation (X_8) contributes to the explanation of the variance of adoption behavior.

E.H. 21: The score on authoritarian - non-authoritarianism orientation will explain a significant amount of the variance in the adoption quotient. The statistical hypothesis stated in the null form is: The additional sum of squares for regression added by the variable X_8 after the variables X_{11} (economic), X_6 (fatalism), X_{17} (traditionalism), X_{15} (security) and X_{14} (familism) is zero. The computed F-ratio is 4.763 with 1 and 156 degrees of freedom which is significant at the .025 level of probability. The null hypothesis is refuted. The data support the original proposition.

The Prediction Equation

An estimate of the adoption behavior may be secured by substituting appropriate values of X_{11}, X_6, X_{17}, X_{15}, X_{14}, and X_8 in the prediction equation.

$$Y = a + b_1 X_{11} + b_2 X_6 + b_3 X_{17} + b_4 X_{15} + b_5 X_{14} + b_6 X_8$$

where "a" is constant and b_{11}, b_6, b_{17}, b_{15}, b_{14}, and b_8 are respective coefficients of regression of X_{11}, X_6, X_{17}, X_{15}, X_{14}, and X_8. The value of regression coefficients have been determined earlier. After solving for the "a" value, sometimes called the "Y-intercept," the prediction equation is obtained.

$$Y = 17.960 + .273 X_{11} - 1.016 X_6 - .821 X_{17} + .388 X_{15} - .489 X_{14} + .825 X_8 .$$

By substituting a cultivator's score on each of the six independent variables, his adoption score may be estimated. An attempt has been made to construct a prediction table (Table 16, Appendix A) from the prediction equation given above. A scatter diagram pertaining to multiple regression is also given (Figure 6, Appendix A).

A Hierarchical Pattern of Occupational Value Orientations

No cultivator can persue all values or for that matter all value orientations at the same time with the same degree of preference. The individual is forced to make a choice between the goals and means that he values. This notion is more easily understood at the cultivator's level, where a new practice may bring more money and save time but conflicts with desire for hard work. This situation then leads to an important characteristic of hierarchical structure involved in value orientation: some are more preferred than others, some are more permissible than others, some are more dominant than others and so on. However it may be pointed out that there may be variability from situation to situation. In this section an attempt is being made to identify and establish a general hierarchical pattern of occupational value orientation of Indian cultivators. A modified form of paired comparison technique (27) is used to approach this problem. The eight statements[1] were presented in all possible pairs so that each cultivator made comparative judgment. The twenty-eight cards, each containing a pair of statements, were administered to each of the 175 cultivators. In general a cultivator who agrees more favorably to one statement, probably had a more favorable value orientation than the cultivator who disagrees with the statement. The following steps were taken to find out the hierarchical pattern of the eight occupational value orientations.

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[1]A detailed discussion on the procedure is given in the methodology chapter under the section "Occupational value orientation scale."

Step 1: Table 10 in Appendix A is constructed on the basis of frequencies with which each statement is selected against others known as F matrix. In other words, the table consists of the frequencies corresponding to the number of times each statement is agreed as more favorable than every other statement. The individual cell entry corresponds to the frequency with which the column statement is agreed to be more favorable than the row statement. For example, statement (value orientation) No. 2 was agreed as a more favorable statement than statement (value orientation) No. 1 by the 168 cultivators. In the table the diagonal entries involving a comparison of each item with itself are assumed to be equal to N/2, where "N" is the total number of 175 cultivators in the sample. In this particular case N/2 is equal to 87.5.

Step 2: On the basis of the "F" matrix in Table 10 in Appendix A, a "P" matrix in Table 11 in Appendix A is obtained by dividing the frequency figure of each cell of the "F" matrix table by the total number of 175 cultivators.

Step 3: For the sake of convenience, statements are rearranged on the basis of the column sums of "P" matrix in Table 12 in Appendix A presents the rearrangement of statements in order with the smallest column sum at

the left and with the highest at the right. In interchanging any pair of columns due care was taken to make the corresponding interchange of the pairs of row.

Step 4: The next step was to convert the individual cell entries of "P" matrix in Table 12 in Appendix A represented by "P" values into "Z" values with the help of a statistical table (27, p. 246). As pointed out by Edwards (27), while preparing the "Z" matrix Table 13 in Appendix A the "P" values above or equal to 0.98 and below or equal to 0.02 should be discarded. For example, numbers involving comparisons between statements 2 and 4, 6 and 7 were discarded for this reason. Therefore the "Z" matrix Table 13 in Appendix A these cells are left blank.

Step 5: A matrix, known as "matrix of successive difference" in Table 14 in Appendix A is presented. It was necessary to develop this table because of empty cells in the "Z" matrix. The entries of Table 13 in Appendix A in each column are subtracted from the entries in the column which follows--moving left to right across the tables. Through this process the "matrix of successive differences" was prepared. The sum of the differences are given at the bottom of the table in row 1, and directly under the sums

in row 2, the number of entries involved in each column sum. Dividing these sums by corresponding number of entries contributing to the sum, values were obtained for row 3. At the bottom of the table the statement 2 which represented leisure value orientation was set equal to zero. The other values for remaining statements were obtained by following the formula 2.21 and 2.22 (27, p. 44). These eight values pertaining to eight statements helped to determine the hierarchical pattern of occupation value orientations as given in the following table.

Table 4. The hierarchical pattern of occupational value

Hierarchical pattern from high to low	Calculated value of each; which helped to determine the position
Hard work	1.957
Familism	1.910
Traditionalism	1.893
Freedom	1.863
Scienticism	1.671
Economic	0.658
Security	0.349
Leisure	0.000

The information presented in Table 4 indicates the hierarchical pattern of the eight occupational value orientations. The relative distances within the 8 value orientations are also given. Judged in terms of a preferential hierarchy, hard work, familism, traditionalism, and freedom occupy the highest rating in that order; economics, security, and leisure occupy the lowest position while scienticism has an intermediate value.

Having established the hierarchical pattern on the basis of values calculated through paired comparison technique, a check of internal consistency was made. The check involves determining how well the observed or empirical proportions agree with those to be expected in terms of derived values. The absolute average discrepancy was 0.033. This value indicates that internal consistency is satisfactory as shown by the low average discrepancy between theoretical proportions and the observed proportions.

DISCUSSION

Introduction

To pursue this research endeavor further a general discussion of the findings will be given and certain implications for future research will also be pointed out.

This dissertation has examined the relationship between value orientations of cultivators and their adoption behavior. More specifically, this study has attempted to determine what role value orientations play in adoption of improved farm practices.

Two types of value orientation, folk and urban, classified in terms of levels, general and occupational, were delineated and conceptually and empirically examined. The extensive and operational definitions of the terms, types of value orientation (folk and urban) and level of value orientation (general and occupational), were given. Adoption behavior was conceptualized as behavioral adoption and was defined as actual trying or using a practice on a continuing basis.

The general position that values or, for that matter value orientations, are related to behavior was taken, but this notion was considered to be a proposition. Through this proposition an examination was made of behavior which is not only the function of value orientation alone but other factors such as past experience, beliefs, and many situational and personal factors. Two general hypotheses were derived concerning the relationships between value orientation and adoption behavior.

General Hypothesis 1

The cultivators possessing more of the value orientations associated with folk type will exhibit a lesser degree of adoption behavior.

The above general hypothesis implies that cultivators possessing more of value orientations associated with urban type of value orientations will exhibit a greater degree of adoption behavior.

Under the general hypothesis 1, there were two sub-general hypotheses.

Sub-general hypothesis 1-1

The cultivators possessing more of the value orientations associated with the general value orientations of folk type will exhibit a lesser degree of adoption behavior.

Sub-general hypothesis 1-2

The cultivators with a greater degree of occupational value orientations of folk type will exhibit a lesser degree of adoption behavior.

General Hypothesis 2

Adoption behavior of cultivators can be in part predicted from the type and level of value orientations that they possess.

In order to have a prediction equation, personal and situational variables were included. Keeping this in view the general hypothesis then stated as "the adoption behavior of cultivators can in part be predicted from the type and level of value orientations that they possess taking into account situational and personal factors."

Under the general hypothesis 2, there was one sub-general hypothesis.

Sub-general hypothesis 2-1

Types and levels of value orientations possessed by cultivators will explain a significant amount of variation in adoption behavior or can be used to predict in part adoption behavior taking into account the amount of variation "explained" by personal and situational factors.

The literature relevant to value orientations and adoption behavior was reviewed, and 5 dimensions of general value orientations were derived deductively and 8 occupational value orientations were derived inductively. These 13 value orientations were operationalized by 13 scales, 5 for general and 8 for occupational value orientations. The first one was a modified form of Likert type and the second was a modified form of paired comparison type. Certain modifications were needed to attempt to adjust to the situation and to obtain more accurate measurement of the value orientations under investigation. Adoption behavior was operationalized by the adoption quotient developed by Chattopadhya (16).

A number of sub-hypothesis and empirical hypotheses were derived from the sub-general hypotheses. Each of the general hypotheses were tested by inference from the results of the tests of these empirical hypotheses which related the empirical measures of the various value orientations and adoption behavior.

The hypotheses which were tested have now been summarized. The findings relative to these hypotheses will now be discussed. The discussion of the findings is organized in the following manner. The

distribution of cultivators in relation to their value orientations and adoption behavior will be taken up. Along with this the findings obtained through testing of empirical hypotheses will also be discussed.

Value Orientations and Cultivators

General value orientations and cultivators

Table 5 in Appendix A gives the raw and percentage frequencies and cumulative raw and percentage frequencies of the distribution of scores on the conservatism - liberalism value orientation. The other statistical measures, mean, median, mode and standard deviation of the distribution appear at the bottom of the table. The table indicates that the mean and median of the distribution approaches each other closely while the mode is higher. From the data in the table it is evident that 84 per cent of the sample lie within the score range from 14 to 19 (This is approximately $M \pm 1$ S.D.).

Another significant fact is that the hypothetical maximum range of the scale was from 5 through 20 and the mid point was 12.5. The observed distribution pattern shows only 13 frequencies below the score 12.5 It can be concluded that cultivators in this area are conservative but all are not equally conservative.

The zero order correlation table (Table 15 in Appendix A) suggests a negative association between conservatism value orientation and adoption behavior. Most of the cultivators in the sample tend to have a low adoption quotient score and high conservatism score. This brings out the fact that most of the cultivators are conservative as well as low adopters.

Table 6 in Appendix A deals with scores obtained on fatalism - scienticism orientation representing the raw and percentage frequencies; the cumulative raw and percentage frequencies of distribution of score and also the mean, median, mode, and the standard deviation of the distribution. From the different statistics it is evident that the distribution deviates somewhat from normality. It may be observed in the table that 58 per cent of the sample lie within the score range 13 to 17 (this is approximately M $\pm$ 1 S.D.). The distribution starts from a score of 10 rather than 5. This signifies lack of a strong scientific value orientation among the cultivators. They exhibited different degrees of fatalism - scienticism orientation. It can again be concluded that cultivators in the area are fatalistic but all are not equally fatalistic.

A negative association between fatalism and adoption was found. This negative relationship is exhibited by the zero-order correlation (Table 15 in Appendix A). The table suggests that low adoption behavior was associated with higher fatalism value orientation. Higher adoption tended to be associated with low fatalism and consequently with higher scienticism.

Table 7 in Appendix A presents the raw and percentage frequencies; the cumulative raw and percentage frequencies and mean,median,mode and standard deviation of the distribution of the scores obtained by the authoritarianism - non-authoritarianism orientation scale. From the different statistics it is evident that the distribution approaches normality. There is almost no discrepancy between the mean and the median.

It may be observed that 70 per cent of the sample lies within the score range from 11 to 15 (this is approximately M ± 1 S.D.). The distribution starts from the score 9 rather than 5; this signifies lack of strongly non-authoritarian value orientation among the cultivators. They exhibited different degrees of authoritarianism - non-authoritarianism value orientation. It can be said that the bulk of the population had neither strong non-authoritarian values nor were they strongly authoritarian but they tended to orient themselves in the middle of the dimension. This suggests that they are partly authoritarian and partly non-authoritarian, as indicated by the scale values.

The zero order correlation in Table 15 in Appendix A suggests there is no positive relationship between adoption and non-authoritarianism, on the contrary there was a negative relationship between adoption and non-authoritarianism. The correlation coefficient was large enough to be significant at the .01 level of probability but the relationship was not in the direction hypothesized by a one-tailed test. Table 7 suggests low adoption behavior is associated with higher non-authoritarianism. Higher adoption tends to be associated with higher authoritarianism.

Table 8 in Appendix A presents the raw and percentage frequencies; the cumulative raw and percentage frequencies and mean, median, mode and standard deviation of the distribution of the scores obtained by the localite - cosmopolite orientation scale. From the different statistics it is evident that distribution almost approaches normality. There is very little discrepency among mean and median. It may be observed that 87 per cent of the sample lies within the score range from 13 to

16 (this is approximately M ± 1 S.D.). The distribution starts from score 11, which signifies lack of strong cosmopolite value orientation among the cultivators. Cultivators exhibited different degrees of localite - cosmopolite value orientation. The majority of them are near the middle of the dimension, signifying that they are partly localite and partly cosmopolite.

A negative association between adoption behavior and localite is found. The negative association is exhibited by zero order correlation (Table 15 in Appendix A). The table suggests that low adoption behavior is associated with higher localite. Higher adoption tends to be associated with low localite and consequently with higher cosmopolite.

Table 9 in Appendix A presents the raw and percentage frequencies; the cumulative raw and percentage frequencies and mean, median, mode and standard deviation of the distribution of the scores obtained by the external conformity - individualism orientation scale. From the different statistics it is evident that distribution tends to be normal. There is almost no discrepancy among mean and median. It may be observed that 87 per cent of the sample lie within the score range from 13 to 16 (this is approximately M ± 1 S.D.). The distribution starts from score 11, which signifies lack of strong individualism value orientation among the cultivators. Cultivators exhibited different degrees of external conformity - individualism value orientation. The zero order correlation (Table 15 in Appendix A) suggests there was no positive relationship between adoption and individualism. On the contrary there is negative relationship between adoption and individualism significant at the .01 level of

probability, but the relationship was not in the direction hypothesized. This negative relationship between individualism and adoption behavior is exhibited by zero order correlation (Table 15 in Appendix A). The table suggests low adoption behavior is associated with higher degree of individualism. Higher adoption tends to be associated with low individualism and consequently with higher external conformity.

The correlations of each of the 5 independent variables of general value orientation with the adoption quotient indicated the association between conservatism and adoption quotient; between fatalism and adoption quotient; and between localite and adoption quotient were found inversely related, those between authoritarianism and adoption quotient and between external conformity and adoption quotient were directly related. This suggests that the less a person is fatalistic, conservative, and localite, and the more he tends toward authoritarianism and external conformity, the more it is expected that he tends to have higher adoption quotient and vice versa. The result pertaining to authoritarian - non-authoritarian and external conformity - individualism was contrary to expectation. This is perhaps a commentary on the type of value orientation in the Indian cultivators. Indian cultivators are still living in the folk type of society in which these value orientations are predominant.

The three general value orientations: conservatism, fatalism, and localite were found to be significantly negatively related to adoption behavior. The pattern of relationships was also found in other studies (9, 37, 87). It has been noted that two general value orientations,

authoritarian and external conformity were found to be positively related to adoption behavior instead of negatively related as indicated by the original proposition. This pattern of relationships has also been found in other studies conducted in India (16, 76).

Occupational value orientation and cultivators

Through a modified form of pair comparison technique the hierarchical pattern of occupational value orientations of cultivators was derived. Here the discussion is made on the rationale of this pattern which is given below.

Hard work Indian cultivators tend to put a premium on hard work because primitive farming as carried out in India does mean painstaking work and anyone especially with low landholding and a subsistence economy cannot afford to take things easy. Year after year, season after season, not only does the cultivator have to work hard, he has also by sheer physical effort to offset effects of the vagaries of the weather and the scarcity of irrigational facilities. One can say that hundreds of years of traditional farming with its attendant hazards have impressed on the cultivator that farming and hard work cannot be detached from each other. Due to this particular form of reference, he still tends to feel that leisure has no place in farming in India. He thinks any program that emphasizes leisure cannot have taken all the occupational hazards of Indian farming into consideration. The typical farmer in India tends to equate leisure with idleness.

Familism The gregariousness of the Indian cultivators has been stressed by sociologists, anthropoligists (24, 46), and others who have a

chance to observe his mode of life and philosophy. Some writers have gone to the extent of describing urban gregariousness as a congregation of numbers whereas rural gregariousness is a communion of personalities. In the rural areas there is a great deal of opportunity to share disappointments, hopelessness of the future, the present struggle against a hostile environment. The cultivator meets other cultivators at the baithaks (sitting place) for some type of entertainment and also to spend those interminable evenings when he has no farming operations to pursue. It is to the family and relatives he turns for advice and encouragement in the day to day conduct of affairs.

Traditionalism The Indian farmer is ingrained in his traditionalism. He has learned of cultural stereotypes and he tends to develop an attitude of reliance on anything which has been historically handed down.

Freedom The cultivator holds freedom as one of the top four among the occupational values. Perhaps those cultivators who cling to farming as a way of life rather than as a vocation describe freedom as one of their important values towards farming because freedom is an aspect of farming as a way of life. It appears that the love of the open air, gregariousness, traditionalism, familism and freedom all tend to go together as they seem to be related values. This expectation has been supported by the findings in the investigation.

Scienticism Scienticism had an intermediate score and has rather an ambiguous position in the hierarchical order. The fact that it enjoys a higher value than economics, security and leisure seems to indicate that cultivators are beginning to see the benefits of scientific farming

in terms of the power to improve their lot. This may not mean that cultivators have a good knowledge of scientific farming, but only that in this Khaujawala block contact with the Indian Agricultural Research Institute's extension activity has created this awareness.

Economics The low ranking of economic value orientation can perhaps be interpreted in at least two ways. To start with, the traditionally oriented cultivators do not perceive outputs versus inputs in terms of money. If the land can provide them with enough crops to fulfill their basic needs, they do not take much interest in how much more they can earn. Cultivators have no clear conception of economics in terms of the monetary value involved. Although they may sell their grain so that they may buy the necessities of life, it is essentially barter because they do not usually accumulate money as a result of their transactions. They merely convert the money obtained into other essential commodities.

Secondly, the low ranking of economics can be seen as a defence mechanism. They see other people thriving on the fruit of their (cultivators) toil; the cultivators remain poor whereas they think the middlemen and the traders are becoming rich. The cultivators can see no way to improve their lot. Under these circumstances, they may seek some frames of reference which would explain the various frustrations that encompass them.

Security By relegating security to the penultimate position the cultivator proves himself to be realistic having full awareness of the actual situation. What with the natural calamaties, the non-availability of essential facilities and his own limitations, the cultivator perceives

hazards in his occupation. As a result he realizes that there is very little security either for now or for the future in farming.

Leisure The cultivator who places a high premium on hard work cannot but relegate the value leisure to the last position. Though it may not be so in all cases, hard work, as he knows, does not allow the co-existence of leisure. It has already been mentioned that the average cultivator tends to equate leisure with idleness.

As regards to occupational value orientations and adoption behavior, it may be noted that the four occupational value orientations: scientism, economic, security, and freedom are positively related to adoption behavior. This pattern of relationship has also been found in other studies (36, 66). The other three occupational value orientations: traditionalism, familism, and leisure are negatively related to adoption behavior. The pattern of relationship for traditionalism and familism has also been found in other studies (9, 66, 87). Leisure as an occupational value orientation was hypothesized to be positively related to adoption behavior, but the findings did not support the proposition. This negative relationship may be due to the fact that the higher adoptors do not hold this value. The relationship between hard work orientation and adoption behavior is not significant. The lower correlation between hard work value orientation and adoption behavior may be a function of differences in actual and hypothetical behavior, i.e., cultivators do not always behave like they say they would behave.

Personal and situational variables and cultivators

Most of the situational and personal variables analyzed in this study were not significantly related to adoption behavior. Membership

was found to be the only personal variable related significantly with adoption behavior.

The reasons for the lower coefficient of correlation between the other situational and personal variables with adoption behavior are not clear. However, this does not mean that their influence can be underestimated. On the contrary these variables do influence the relationship, and knowledge of such variables can lead to more meaningful data interpretation (21).

Variation and prediction of adoption behavior of cultivators

The data in Table 2, analysis of variance associated to step-wise regression analysis, showed that the sum of squares for regression added by all eighteen variables explained a significant proportion of the variation in adoption behavior. But this analysis further indicated that six variables contributed as much as all of them combined. These six variables[1] were economic value orientation, fatalism value orientation, traditionalism value orientation, security value orientation, familism value orientation, and authoritarianism value orientation. The individual contribution made by each one of them was tested and the contribution was found to be significant. This means that each variables' contribution in explaining the variation in adoption behavior was significant at the given F level. The additional sum of squares due to regression added by the remaining 12 variables after the six variables,

[1]Out of the six variables, two (fatalism and authoritarianism) belong to general value orientation dimensions and the remaining four belong to the occupational value orientation. No personal or situational variables were statistically chosen.

was found to be zero. This means the remaining 12 variables did not make significant contribution in explaining adoption behavior at a given F level. None of the situational or personal variables appeared in the regression equation.

Based on the findings discussed above the following conclusions are made:

1. Value orientations are significantly related to adoption behavior (general hypothesis 1). The analysis of data through zero-order correlation supported this relationship. At the general level some of the relationships were not in the hypothesized direction such as: between external conformity and adoption behavior; between authoritarianism and adoption behavior. These relationships were found to be positively related rather than negatively. At the general level, though the data suggests that there is a relationship between value orientations and adoption behavior, the data further suggests that all folk types of value orientations are not necessarily related to low adoption. At the specific level (occupational) leisure value orientation of urban type was hypothesized as positively related to adoption. The result obtained through zero-order correlation failed to support this relationship. Leisure, a posited urban type of value orientation, was expected to be positively related with adoption behavior, but it was not found to be so. This

finding points out that all urban type of value orientations do not necessarily mean higher adoption in the rural setting.

2. Value orientations, personal, and situational variables can be used in part to predict adoption behavior (general hypothesis 2). The linear model of regression equation appears to be the most appropriate model to describe the predicted relationship between the value orientations and adoption behavior investigated here. The step-wise regression analysis helped to select the 6 independent variables for regression equation. An inspection of the scatter diagram (Figure 6 in Appendix A indicates that error involved in prediction is low. The value orientations such as economic, fatalism, traditionalism, security, familism, and authoritarianism predict 78 per cent of variation in adoption behavior.
3. The data suggests a profile of Indian cultivators who hold both folk and urban types of value orientations in varying degrees. By and large, they hold basically the folk type at the general and the occupational levels. While the folk type is predominant, the data do support the theoretical position of Redfield (68) that the peasantry hold both folk and urban value orientation.
4. More specifically, the study has shown that Indian cultivators possess a particular profile of value

orientation in relation to their adoption behavior which is a combination of both types (folk and urban) at the general and specific levels. The profile of value orientation consists of such value orientations as economic, fatalism, traditionalism, security, familism and authoritarianism. There are other value orientations but the study indicated that these are the main ones studied relevant to adoption behavior. However, this profile may change from one behavioral setting to another.

5. The data pertaining to occupational value orientation hierarchy suggests that there was a cluster of four occupational value orientations which may be considered as a configuration of occupational value orientation (see Table 4). The value orientations forming the cluster were hard work, traditionalism, familism, and freedom. This cluster is basically dominated by such occupational value orientation as familism, traditionalism and hard work which were either negatively related or not related to adoption behavior. In view of this, it is likely that many of the innovations are seen by the cultivators, not as measures which would improve their security and economic position in farming but as systems which would barter away familism, hard work, and traditionalism. These are all highly desired occupational value orientations in the cultivators way of thinking.

The data support the following theoretical position of Bohlen and Beal (8) who state that:

> "Part of man's value system is the tendency to organize both ends and means into more or less organized hierarchies on the basis of favorableness and acceptability to himself as an individual. He may place these in juxtaposition when making his choices of alternatives. When he does this he may choose a lower level or less favorable goal because the means of attaining the more favorable goal was too unsatisfactory for him to accept. When a given goal exists with alternative means of attaining it, he inevitably (unless he is mentally ill) chooses the means which he considers most satisfactory to him." (8, p. 6)

Suggestions for Future Research

On the basis of the above discussion and conclusions, certain suggestions for future research will be given. These suggestions are being given primarily on the basis of the principal weakness of the present study as judged by the author.

One of the shortcomings of the present study is the lack of certain conceptual variables such as role and status which may be the determinants of individual's value orientations. Such variables might have increased the ability to explain adoption behavior. They may also be of value to the change agent.

Lecky (45) in his theory of personality postulated that some value orientations which have been accepted into the personality act as barriers to the acceptance of anything new. Lecky further stated that such value orientations in personality are called opposing values.

Implicit in Lecky's notion is the importance of value orientations in behavioral change. It is also implied that value orientations of an individual may either facilitate or inhibit with changes in behavior.

There are four prevailing sets of conditions involved here:

(1) new behavioral changes which are in opposition to values already accepted by a cultivator may be rejected by him.

(2) new behavioral changes may be modified so that they are no longer in opposition to the values accepted by a cultivator,

(3) new behavioral changes which are in opposition to or are in conflict with accepted values may be ignored, and

(4) accepted values, particularly those which are interfering with change, may be modified so that new behavioral change may be accepted.

A conceptual framework is being suggested in this section keeping in view point 4 of the above. The present study suggested value orientations of cultivators which are positively or negatively related to their adoption behavior. In this sense the study may be useful to the change agent. The study failed to suggest what factors the change agent may examine in order to bring about changes in opposing values leading to desired change in behavior. For example, fatalism is one of the value orientations which operates as opposing value when change in behavior is envisaged. If the change agent is aware of some factors which can be

examined, and manipulated to bring about modification in the fatalism value orientation then the study should be more meaningful to him.

Keeping the above notion in view, a conceptual framework is presented which should help derive factors, for future study, which could be more useful for the change agent. The following figure illustrates a suggested conceptual framework.

The cultivator's adoption behavior is partly a function of his value orientation. The value orientations of a cultivator is a function of many other factors such as depicted in Figure 5: social systems or sub-systems, his status and role, personal variables, and situational variables. Therefore it appears more accurate to predict a cultivator's adoption behavior as a function of: his situation, the opportunities available to him, the goods and services he uses and consumes, the values he holds, his status-role, and the type of community in which he lives.

As shown in Figure 5, the variables other than value orientations are important enough to be included in future studies of similar types. Such studies not only add more to the body of knowledge but may also provide some factors to change agents for examination and manipulation to bring about modification in existing opposing value orientation such as fatalism. Through such modification new behavioral change can be affected. The conceptual framework used in the dissertation provided only a partial view of the problem of value orientations and adoption of improved farm practices.

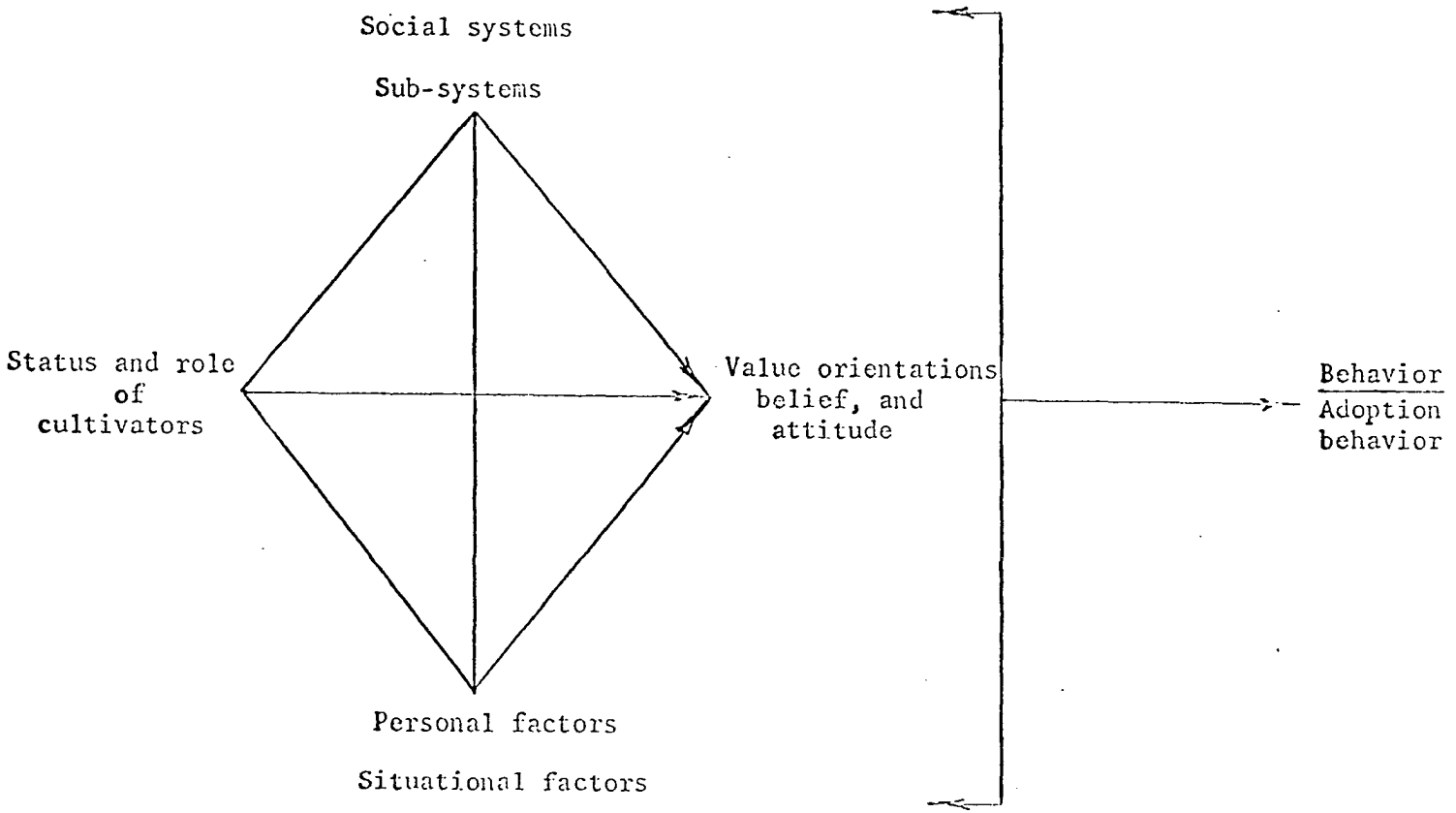

Figure 5. A suggested conceptual framework for analysis of the social and social-psychological variables related to adoption behavior

The other suggestion, which is somewhat related to the first one, is in regard to situational and personal variables when value orientation and adoption behavior are under study. The author is not aware of any research studies which have examined the effect of situational variables. Warland (89) had a similar reaction in his study. The lack of proper treatment of situational and personal variables has also been a major limitation of this study. Some studies (20, 21) have examined the influence of situational variables upon the relationship between attitudes and behavior. DeFriese and Ford (21), for example, have demonstrated that when measures of the influence of mechanisms of social constraint are used in conjunction with conventional measures of attitude, a greater reduction in the errors in the prediction of overt behavior occurs than when either attitudes or social constraint are considered alone. Studies which have been concerned with situational variables have considered certain reference groups to be the social constraint mechanism which intervene and mediate the relation between attitude and overt behavior.

The available measure of situational and personal variables are not adequate to determine the precise impact of these upon the relationship between value orientations and behavior. In addition to this, the conceptual model did not have a variety of situational and personal variables. Future studies should consider including more situational and personal variables so that the relationships between value orientation and behavior can be more fully understood.

An examination of the analysis of data and additional analysis reveals that magnitude of a given multiple correlation coefficient and

the magnitude of the highest zero-order correlation coefficient involved in the computation of that multiple correlation coefficient do not differ sufficiently. This is most likely a result of the very high interrelationship among the thirteen independent variables. Putting the above notion differently, it means if two variables are highly interrelated the second will be explaining essentially the same variance as the first.

The possible explanation for such congruence may be due to lack of clear and precise definitions of the concepts. This may have resulted in two measures which measure essentially the same things, consequently resulting in high intercorrelation among the independent variables. Guttman has divided the issue of validity into "internal validity" and "external validity" (35). In future studies the problem of mutually exclusive definitions can be handled by recognizing the idea of external validity of Guttman's. A perfect validity can be reached if the measurement has the same scope of content as the definition. This is difficult to achieve. The definition, intensive or extensive, implies three things in terms of its indicator or measurement. These are: 1) the definition may imply something other than the indicator, 2) the indicator may imply something other than the definition, and 3) the indicator may imply the definition and vice versa. In this dissertation the problem of lack of preciseness was probably of both the conceptual level and measurement or indicator level. Future studies should reconsider the present definitions of various concepts used in this dissertation as a basis for a more precise definition through the process of external validation at a conceptual level.

The results of the study suggest that the scaling technique used to measure general value orientation provided a relatively good operational measure of concepts. However, some refinements could be carried out such as the one being suggested here.

In empirical measures used to quantify the five general value orientations, no validity study, as such, was made for the five dimensions of general value orientation scales. An attempt at validity was built into the process of the preparation of the scales. The criterion for selection of statements for the scales was the unanimity of the judges, "Jury Opinion" (33). The items should have been subjected to further validation through a process of "known group" technique (33). In this case, statements selected for the scales on the basis of "jury opinion" would be further tested by selecting a "known group" of high adopters and another of low adopters. For example, the statements pertaining to the scale conservatism - liberalism should have been tested to find out if in actuality these statements do discriminate the two groups. If they do, then the statements pertaining to liberalism will have greater approval in the high adoption group. In the same way, the statements pertaining to conservatism should have greater approval in the low adopter group. In future studies such as this, where there is relatively more emphasis on development of measurement, attempts should be made to further validate by combining both "judge's opinion" and "known group" techniques. However it may be pointed out that this method, while widely used, always carries with it the danger that there might be other differences between the groups in addition to their known behavior which

might account for differences. There is also the danger of "fold-back" validity--the scale is developed involving the variables one is trying to predict. As a result only very careful use of the "known group" techniques should be made.

Finally, future studies may wish to include the notion of commitment when examining value orientations. The intensity of commitment to a given value orientation may vary directly with the degree of consistency between value conceptions and behavior. The individual who is strongly committed to a value orientation is emotionally involved with that value orientation and most likely will behave more according to his value orientation than one who has a low commitment to the same value orientation. Such understanding is also needed for the change agent so that he can work out a plan which does not disturb those value orientations where there is a high degree of behavioral commitment. He might suggest to cultivators ideas which would take into account the existing pattern of value orientations with a high degree of behavioral commitment while emphasizing others such as economic value orientation and scienticism value orientation. Then the introduction of better farming practices has a greater chance of success.

The use of verbal statements as a means to measure value orientations appeared to have been a relatively successful technique in this study. But in order to understand the degree of behavioral commitment, a large variety of statements should be developed so that the structure of everyday life experience and conduct is reflected in them. In addition to the inclusion of a large variety of statements, non-participant

observation and informal discussion with cultivators should also be used.

In summary, the opinion of the author is that the research reported in this dissertation has demonstrated that value orientations of Indian cultivators are related to their adoption behavior. However, in order to bring about improvement in theory and methodology several points for future consideration were given. The main point being that the present research, as such, did not provide much information for a change agent to modify the existing value orientation of cultivators. Therefore a conceptual model to derive additional variables for inclusion in future research was suggested.

SUMMARY

The dissertation reports a study to determine the relationship between value orientations of Indian cultivators and their adoption behavior. In India eighty to eighty-five per cent of the population live in villages primarily dependent on agriculture and agriculture contributes fifty per cent of the national income. The importance of and need for understanding the process of adopting agricultural technology can hardly be overemphasized. The acceptance of innovations is an essential factor needed for increased and more effective agricultural production. With adoption as the dependent variable and value orientations as the independent variables, the main objectives of the study were to:

1. Identify and measure general value orientation.
2. Identify and establish a hierarchical pattern of occupational value orientation.
3. Determine the degree of association between general value orientation and occupational value orientation, and each with the adoption behavior of cultivators.
4. Determine the degree to which general value orientations and occupational value orientations will predict adoption behavior.
5. Determine the degree to which personal and situational variables together with the general value orientations and occupational value orientations will predict adoption behavior.

The basic assumption made was that variation in behavior is partly a function of individual's value orientation and partly a function of situational variables. The conceptual analysis was primarily based on the two general level concepts: value orientation and behavior. The term value orientation was conceptualized in terms of folk and urban types of value orientation and level of value orientation--general and specific (occupational). The five dimensions of general value orientation and eight occupational value orientations were classified into the two types of value orientation--folk and urban. The folk types of general value orientation were derived as conservatism, fatalism, authoritarianism, localite, and external conformity. The folk types of occupational value orientation were hard work, traditionalism, and familism. The urban types of general value orientation were derived as liberalism, scienticism, non-authoritarianism, cosmopolite, and individualism. The urban types of occupational value orientation were freedom, scienticism, security, leisure, and economic. The second general level concept, behavior was conceptualized as adoption behavior.

Using the above conceptual framework a theoretical position was stated that the adoption behavior of cultivators will vary with and can be in part predicted from the type and level of value orientation.

Some selected situational and personal factors were also examined to determine if they have any impace upon the relationship between value orientation and adoption behavior.

The above theoretical position was tested by a number of hypothesis: two general hypotheses, three sub-general hypotheses, twenty-one sub-

hypotheses and twenty-one empirical hypotheses. The three sub-level concepts general value orientation, occupational value orientation and adoption behavior were operationalized and measured by scales. The general value orientation involved five scales: conservatism - liberalism, fatalism - scienticism, authoritarianism - non-authoritarianism, localite - cosmopolite, and external conformity - individualism . The occupational value orientation involved the composite scale consisting of eight statements, each representing one occupational value orientation: hard work, traditionalism, familism, freedom, scienticism, leisure, security, and economic. The adoption behavior was operationalized and measured by an adoption quotient.

The sample used to test the hypotheses developed in this research consisted of 175 cultivators (heads of family) living in Khanjawala Block of union territory of Delhi, India. The sampling procedure adopted was proportionate stratified random sampling. The data for this study were collected during the year 1962-1963. The general field procedure used to collect data consisted of personal, individual interviews.

In general, findings of the research provided support to the theoretical position stated above. The first general hypothesis was: the cultivators possessing more of the value orientations associated with folk type will exhibit a lesser degree of adoption behavior. This general hypothesis implies that cultivators possessing more of the value orientation associated with urban type of value orientation will exhibit a greater degree of adoption behavior. The general hypothesis 1 was tested by determining the relationship between each of the thirteen independent variables belonging to the general and occupational value

orientation, classified as folk and urban types, and adoption behavior. The coefficient of correlation between scores on each of the thirteen value orientations and adoption quotient score were as follows:

At the general value orientation level: conservatism value orientation -0.7066 significant at the .01 level; fatalism value orientation -0.7435 significant at the .01 level; authoritarianism value orientation 0.7373 not significant at the .01 level probability for a one-tailed test; localite value orientation -0.6465 significant; and external conformist value orientation 0.6813 which is not significant at the .01 level of probability for a one-tailed test.

The relationship between these five dimensions of general value orientation and adoption behavior, tend to support the relationship between general value orientation and adoption behavior. One observation from these findings is that all folk types of general value orientations are not necessarily negatively related to adoption behavior of Indian cultivators.

At the occupational value orientation level: economic orientation 0.8171 significant at the .01 level; leisure orientation -0.5755 not significant at the .01 level of probability for a one-tailed test; scienticism orientation 0.6824 significant at the .01 level; security orientation 0.6723 significant at the .01 level; familism orientation -0.7585 significant at the .01 level; freedom orientation 0.6517 significant ath the .01 level; traditionalism orientation -0.7956 significant at the .01 level; and hard work orientation -0.0907 which is not significant at the .01 level.

Again, except in the case of hard work, all other occupational value orientations are highly related to adoption behavior. The findings, to a great extent, supported that there is relationship between occupational value orientation and adoption behavior. One observation is that all urban type of value orientations are not necessarily positively related to adoption behavior.

The second general hypothesis was: adoption behavior of cultivators can be in part predicted from the type and level of value orientation that they possess, taking into account situational and personal variables. The analysis showed, when the 18 independent variables (5 general value orientations, 8 occupational value orientations, 3 situational variables, and 2 personal variables) were taken together, they contributed significantly in predicting the variation in adoption behavior (R^2 = .798). Step-wise regression analysis was used to determine the best predictors out of these eighteen independent variables. Through step-wise regression analysis 6 variables, economic orientation, fatalism orientation, traditionalism orientation, security orientation, familism orientation and authoritarianism orientation were selected for the final regression equation on the basis of their individual contribution. The remaining 12 variables may contribute in predicting the variation in the adoption behavior, but such contribution was found to be not significant at a given level of probability. The R^2 for the six variables was found to be .784. No situational or personal variable appeared in the final regression equation.

The final phase of analysis was focussed on determining a hierarchical pattern of occupational value orientation of Indian cultivators.

Paired comparison technique was used to determine the hierarchical structure involved. The final hierarchy which emerged as a result of this study was in the following order: hard work, familism, traditionalism, freedom, scienticism, economic, security, and leisure. The paired comparison scale values also helped to determine the relative distances between each occupational value orientation. Judged on the basis of scale values, hard work orientation, familism orientation, traditionalism orientation and freedom orientation occupy the higher rungs in that order and they have a tendency to cluster together. Economic orientation, security orientation and leisure orientation occupy the lower positions while scienticism orientation has an intermediate position.

Suggestions for future research and suggested ways in which the present analysis could have been made more useful for the purposes of a change agent are given in the final sections of the thesis.

LITERATURE CITED

1. Adler, F. The value concept in sociology. American Journal of Sociology 62: 272-279. 1956.

2. Adorno, T. W., Frenkel-Brunswick, E., Levinson, D. J., and Sanford, R. N. The authoritarian personality. New York, New York, Harper Brothers. 1950.

3. Allport, G. W., Vernon, P. E., and Lindzey, G. Study of values. 3rd ed. Boston, Mass., Houghton Mifflin. 1960.

4. Beal, G. M. and Rogers, E. M. The adoption of two farm practices in a central Iowa community. Iowa Agricultural Experiment Station Special Report 26. 1960.

5. Becker, Howard. Systematic sociology. New York, New York, John Wiley and Sons, Inc. 1932.

6. Berelson, Bernard and Steiner, Gary A. Human behavior: an inventory of scientific findings. New York, New York, Harcourt, Brace and World, Inc. 1964.

7. Bernard, L. L. A theory of rural attitude. American Journal of Sociology 22: 620-649. 1917.

8. Bohlen, Joe M. and Beal, George M. Sociological and social psychological factors related to credit use patterns. Unpublished paper presented at annual conference of TVA cooperators, Knoxville, Tennessee. Mimeographed. Ames, Iowa, Department of Economics and Sociology, Iowa State University of Science and Technology. 1960.

9. Bose, S. P. Peasant values and innovation in India. American Journal of Sociology 67: 552-560. 1962.

10. Bose, S. P. and Dasgupta, S. The adoption process. Government of West Bengal, India, Department of Agriculture Bulletin 1. 1962.

11. Brogden, Hubert E. The primary personal values measured by the Allport-Vernon Test, "A Study of Values". Psychological Monographs 66, No. 16: 1-31. 1952.

12. Carnap, Rudolf. Logical foundations of probability. Chicago, Illinois, University of Chicago Press. 1950.

13. Carter, C. F. and Williams, B. R. Industry and technical progress: factors governing the speed of applicates of science. London, England, Oxford University Press. 1957.

14. Carter, Harold D. Vocational interests and job orientation. Applied Psychology Monographs 2: 1-85. 1944.

15. Catton, W. R., Jr. A theory of value. American Sociological Review 24: 310-317. 1959.

16. Chattopadhya, S. N. A study of some psychological correlations of adaption of innovations in farming. Unpublished Ph.D. thesis. New Delhi, India, Library, Indian Agricultural Research Institute. 1964.

17. Cocking, W. The regional introduction of educational practice in urban school system in the United States. 1951. Original not available for examination; cited in Rogers, E. M., Diffusion of innovations. pp. 41-42, New York, New York, The Free Press of Glencoe, 1962.

18. Cooley, C. H. Social organization. New York, New York, Scribner. 1909.

19. Copp, J. H. Personal and social factors associated with the adoption of recommended farm practices among cattlemen. Kansas Agricultural Experiment Station Bulletin 83. 1956.

20. DeFleur, M. and Westie, F. R. Verbal attitudes and overt acts: an experiment in the salience of attitudes. American Sociological Review 23: 667-675. 1958.

21. DeFriese, G. H. and Ford, S. W. Verbal attitudes, overt behavior, and the influence of social constraint in interracial behavior. Unpublished mimeographed paper. Lexington, Kentucky, Department of Sociology, University of Kentucky. Ca. 1965.

22. Dodd, S. C. On classifying human values: step in the prediction of human valueing. American Sociological Review 16: 645-653. 1951.

23. Draper, N. R. and Smith, H. Applied regression analysis. New York, New York, John Wiley and Sons, Inc. 1966.

24. Dube, S. C. Indian village. London, England, Rutledge and Kegan Paul, Ltd. 1955.

25. Duncan, J. A. and Kreetlow, B. W. Selected cultural characteristics and acceptance of educational programs and practices. Rural Sociology 19: 349-357. 1954.

26. Durkheim, E. The division of labor in society. Glencoe, Illinois, The Free Press. 1947.

27. Edwards, Allen L. Techniques of attitude scale construction. New York, New York, Appleton-Century Crofts, Inc. 1959.

28. Edwards, Allen L. and Kenney, K. C. A comparison of the Thurston and Likert techniques of attitude scale construction. Journal of Applied Psychology 30: 72-83. 1949.

29. Emery, F. E. and Ocser, O. A. Information, decision, and action. Carolton, Victoria, Australia, Melbourne University Press. 1958.

30. Ferguson, L. W. Personality measurement. New York, New York, McGraw-Hill. 1952.

31. Fliegel, F. C. Aspiration of low-income farmers and their performance and potential for change. Rural Sociology 24: 205-214. 1959.

32. Fliegel, F. C. A multiple correlation analysis of factors associated with adoption of farm practices. Rural Sociology 21: 284-292. 1956.

33. Goode, William, Jr. and Hatt, Paul K. Method in social research. Alfred A. Knopf, Inc., New York, New York. 1952.

34. Guilford, J. P. Psychometric method. New York, New York, McGraw-Hill. 1954.

35. Guttman, L. The Cornell technique for scale and intensity analysis. In Churchman, C. W., Ackoff, R. L., and Wax, M., eds. Measurement of consumer interest. pp. 60-84. Philadelphia, Pennsylvania, University of Pennsylvania Press. 1947.

36. Hobbs, D. J. Factors related to the use of agricultural chemicals on Iowa farms. M.S. thesis. Ames, Iowa, Library, Iowa State University of Science and Technology. 1960.

37. Hoffer, C. R. and Strangland, D. Farmers' attitudes and values in relation to adoption of approved practices in corn growing. Rural Sociology 23: 112-120. 1958.

38. Kamala, M. M. The measurement of attitudes toward some social and economic problems. Unpublished Ph.D. thesis. Mysore, India, Library, Mysore University. 1960.

39. Kardinar, A. and Linton R. The individual and his society. New York, New York, Columbia University Press. 1939.

40. Katz, E. The social itinerary of technical change: two studies on the diffusion of innovations. Human Organization 20: 70-82. 1961.

41. Kaufman, H. P. Participation in organized activities in selected Kentucky localities. Kentucky Agricultural Experiment Station Bulletin 528. 1949.

42. Kilby, R. W. Value in individual and material life. Psychologia 4: 187-197. 1961.

43. Kluckhohn, C. and others. Values and value-orientation in theory of action. In T. Parsons and Shils, E. A., eds. Toward a general theory of action. pp. 388-433. Cambridge, Massachusetts, Harvard University Press. 1951.

44. Kluckhohn, Florence R. and Strodtbeck, F. L. Variation in value orientation. New York, New York, Row, Peterson and Company. 1961.

45. Lecky, Prescott. Self-consistency: a theory of personality. New York, New York, Island Press. 1945.

46. Lewis, O. Village life in northern India. New York, New York, Random House, Inc. 1958.

47. Likert, R. A technique for measurement of attitude. Archives of Psychology 140: 5-55. 1932.

48. Lindstrom, D. E. Diffusion of agricultural and home economics practices in a Japanese rural community. Rural Sociology 23: 171-183. 1958.

49. Lionberger, H. F. Adoption of new ideas and practices. Ames, Iowa, Iowa State University Press. 1960.

50. Loomis, Charles and Beegle, Allen J. Rural social system. New York, New York, Prentice-Hall, Inc. 1950.

51. Marsh, C. P. and Coleman A. Lee. The relation of farmer characteristics to the adoption of recommended farm practices. Rural Sociology 20: 289-296. 1955.

52. McKeon, R. Conflicts of values in a community of culture. Journal of Philosophy 47: 197-210. 1950.

53. McNemar, Quinn. Psychological statistics. New York, New York, John Wiley and Sons. 1949.

54. Merton, R. K. Social theory and social structure. Glencoe, Illinois, The Free Press. 1964.

55. Murphy, G. and Likert, R. Public opinion and the individual. New York, New York, Harper and Brother. 1937.

56. Nelson, Lowery and McVoy, Edgar. How satisfying is rural life? Rural Sociology 7: 261-267. 1942.

57. Nelson, Lowery, Ramsey, C. E., and Vernon, C. Community structure and change. New York, New York, The Macmillan Company. 1965.

58. Newcomb, Theodore M., Turner, Ralph H., and Converse, Philip E. Social psychology: a study of human interaction. New York, New York, Holt, Rinehart, and Winston, Inc. 1965.

59. Northrop, E. S. C. The logic of the sciences and the humanities. New York, New York, The Macmillan Company. 1949.

60. Opler, Morris E. The context of themes. American Anthropologist 51: 323-325. 1949.

61. Ostle, Bernard. Statistics in research. Ames, Iowa, The Iowa State University Press. 1964.

62. Pareek, U. and Chattopadhya, S. N. Farmers value orientation scale. Manas 12, No. 1: 5-34. 1965.

63. Parsons, T. and Shils, E. A., eds. Towards a general theory of action. Cambridge, Massachusetts, Harvard University Press. 1951.

64. Pederson, H. A. Cultural differences in the acceptance of recommended practices. Rural Sociology 16: 37-49. 1951.

65. Rahim, S. A. The diffusion and adoption of agricultural practices: a study in a village in East Pakistan. Comilla, East Pakistan, Pakistan Academy of Village Development. 1961.

66. Ramsey, C. E., Polson, R. A. and Spencer, G. E. Values and adoption of practices. Rural Sociology 24: 1959.

67. Rao, N. C. S. Factor analysis of social attitudes. Psychological Studies 7: 43-54. 1962.

68. Redfield, Robert. Peasant society and culture. Chicago, Illinois, University of Chicago Press. 1956.

69. Rogers, E. M. Personality correlates of the adoption of technological practices. Rural Sociology 22: 267-268. 1957.

70. Rogers, E. M. and Capener, H. R. The county extension agent and his constituents. Ohio Agricultural Experiment Station Research Bulletin 858. 1960.

71. Rogers, E. M. Characteristics of agricultural innovators and other adopter categories. Ohio Agricultural Experiment Station Research Bulletin 882. 1961.

72. Rundguist, E. A. and Sletto, R. E. Personality in the depression. Minneapolis, Minnesota, University of Minnesota Press. 1936.

73. Rural Sociological Committee. How farm people accept new ideas. Iowa Agricultural Experiment Station Special Report 15. 1955.

74. Ryan, B. and Gross, N. C. The diffusion of hybrid seed corn. Rural Sociology 8: 15-24. 1943.

75. Scott, William A. Values and organizations. Chicago, Illinois, Rand McNally and Company. 1965.

76. Singh, Shyam N. and Auya, H. P., eds. Value-orientation of local village leaders. In Pareek, U. Studies in rural leadership. pp. 49-59. Delhi, India, Behavioral Science Center. 1966.

77. Singh, Shyam N., Khan, A. R., Mulay, S., and Lokhande, M. R. A study of social values in relation to farming. Indian Journal of Extension Education 1, No. 2: 112-118. 1965.

78. Sorokin, Pritrim A. and Zimmerman, Carle C. Principle of rural-urban sociology. New York, New York, Henry Holt and Company. 1929.

79. Straus, M. A. Straus' Rural Attitudes Profile: preliminary manual. Pullman, Washington, State College of Washington. 1956.

80. Taylor, Carl C. Rural sociology. New York, New York, Harper and Brothers. 1933.

81. Thomas, W. I. and Znaniecki, Florian. The Polish peasant in Europe and America. Volume 1. Chicago, Illinois, University of Chicago Press. 1918.

82. Thompson, J. A. What is man? New York, New York, C. P. Putnam's Sons. 1924.

83. Thurston, L. L. and Chave, M. J. The measurement of attitude. Chicago, Illinois, University of Chicago Press. 1929.

84. Tonnies, Ferdinand. Community and society. Translated [by] Loomis, C. New York, New York, Harper and Row. 1963.

85. United States Department of Agriculture. Bureau of Agricultural Economics. The extension service in Vermont. Mimeographed bulletin. Washington, D. C., author. 1947.

86. Van der Ban, A. W. Locality group differences in the adoption of new farm practices. Rural Sociology 25: 307-320. 1960.

87. Van der Ban, A. W. Some characteristics of progressive farmers in the Netherland. Rural Sociology 22: 202-212. 1957.

88. Veblen, Thorstein. The theory of the leisure class. New York, New York, Macmillan and Company. 1899.

89. Warland, Rex. The relationship between rural value-orientation and farm policy position. Unpublished Ph.D. thesis. Ames, Iowa, Library, Iowa State University of Science and Technology. 1966.

90. Weber, Max. The theory of social and economic organization. Translated by Parsons, T. New York, New York, The Crowell-Collier Publishing Company. 1947.

91. Wilkening, E. A. Acceptance of improved farm practices. North Carolina Agricultural Experiment Station Technical Bulletin 92. 1952.

92. Wilkening, E. A. Adoption of improved farm practices as related to family factors. Wisconsin Agricultural Experiment Station Research Bulletin 183. 1953.

93. Wilkening, E. A. Techniques of assessing farm family values. Rural Sociology 19: 38-49. 1954.

94. Williams, R. M., Jr. American society: a sociological interpretation. New York, New York, Alfred A. Knopf, Inc. 1951.

95. Wolff, Kurt. The sociology of George Simmel. Glencoe, Illinois, The Free Press. 1950.

96. Zimmerman, Carle C. The changing community. New York, New York, Harper and Brothers. 1938.

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APPENDIX A

Tables of Empirical Measures

Table 5. Distribution of cultivators conservatism - liberalism value orientation

Conservatism - liberalism scores	Distribution or raw frequencies	Cumulative raw frequencies	Raw frequencies expressed in percentage	Cumulative expressed in percentage
10	2	2	1	1
11	7	9	4	5
12	4	13	2	6
13	17	30	10	16
14	15	45	8	24
15	9	54	5	29
16	20	74	12	41
17	19	93	11	52
18	17	110	10	62
19	65	175	38	100

Mean = 16.5; median = 16.2; mode = 19 S.D. = 2.5

Table 6. Distribution of cultivators in terms of fatalism - scienticism value orientation

Fatalism - scienticism scores	Distribution raw frequencies	Cumulative raw frequencies	Raw frequencies expressed in percentage	Cumulative frequencies expressed in percentage
10	3	3	2	2
11	2	5	1	3
12	18	23	10	13
13	13	36	8	21
14	17	53	10	31
15	35	88	20	51
16	17	105	10	61
17	33	138	18	79
18	37	175	21	100

Mean = 15.4; median = 14.9; mode = 18; S.D. = 2.1

Table 7. Distribution of cultivators in terms of authoritarianism - non-authoritarianism value orientation

Authoritarianism - non-authoritarianism score	Distribution raw frequencies	Cumulative raw frequencies	Raw frequencies expressed in percentage	Cumulative frequencies expressed in percentage
9	4	4	2	2
10	19	23	11	13
11	10	33	6	19
12	26	59	15	34
13	39	98	23	57
14	26	124	15	72
15	19	143	11	83
16	13	156	7	90
17	12	168	6	96
18	5	173	3	99
19	2	175	1	100

Mean = 13.3; median = 13.9; mode = 14; S.D. = 2.3

Table 8. Distribution of cultivators in terms of localite - cosmopolite value orientation

Localite - cosmopolite score	Distribution or raw frequencies	Cumulative raw frequencies	Raw frequencies expressed in percentage	Cumulative frequencies expressed in percentage
11	4	4	2	2
12	11	15	6	8
13	30	45	17	25
14	35	80	21	46
15	34	114	20	66
16	51	165	29	95
17	4	169	2	97
18	4	173	2	99
19	2	175	1	100

Mean = 14.6; median = 14.7; mode = 16; S.D. = 1.6

Table 9. Distribution of cultivators in terms of external conformity - individualism value orientation

External conformity - individualism score	Distribution or raw frequencies	Cumulative raw frequencies	Raw frequencies expressed percentage	Cumulative frequencies expressed in percentage
11	4	4	2	2
12	11	15	6	8
13	30	45	17	25
14	35	80	21	46
15	35	115	21	67
16	50	165	28	95
17	4	169	2	97
18	4	173	2	99
19	2	175	1	100

Mean = 14.6; median = 14.3; mode = 16; S.D. = 1.6

Table 10. The "F" matrix for 8 statements judged by 175 individuals

Statements	1	2	3	4	5	6	7	8
1	87.5	7	157	159	75	162	158	158
2	168	87.5	167	171	103	170	172	169
3	18	8	87.5	111	23	113	111	107
4	16	4	64	87.5	6	79	88	100
5	100	72	152	169	87.5	169	169	166
6	13	5	62	96	6	87.5	90	113
7	17	3	64	87	6	85	87.5	101
8	17	6	68	75	9	62	74	87.5

Table 11. The "P" matrix corresponding to the "F" matrix of Table 10

Statements	1	2	3	4	5	6	7	8	Total
1	0.5000	0.0399	0.8949	0.9063	0.4275	0.9234	0.9006	0.9006	4.9932
2	0.9576	0.5000	0.9519	0.9747	0.5871	0.9690	0.9804	0.9633	6.3840
3	0.1026	0.0456	0.5000	0.6327	0.1311	0.6441	0.6327	0.6099	2.7987
4	0.0912	0.0228	0.3648	0.5000	0.0342	0.4503	0.5016	0.5700	2.0349
5	0.5700	0.4104	0.8664	0.9633	0.5000	0.9633	0.9633	0.9462	5.6829
6	0.0741	0.285	0.3534	0.5472	0.0342	0.5000	0.5130	0.6441	2.1945
7	0.0969	0.071	0.3648	0.4959	0.0342	0.4845	0.5000	0.0575	2.0691
8	0.0969	0.032	0.3876	0.4275	0.0513	0.3534	0.4218	0.5000	1.7727
Total	1.9893	0.5985	4.1838	4.9476	1.2996	4.7880	4.9134	5.2098	27.9300

Table 12. Rearrangement of the statements in rank order of the column sums from least to most the "P" matrix corresponding to the "F" matrix of Table 10

Statements	2	5	1	3	6	7	4	8
2	0.5000	0.5871	0.9576	0.9519	0.9690	0.9804	0.9747	0.9633
5	0.4104	0.5000	0.5700	0.8664	0.9633	0.9633	0.9633	0.9462
1	0.0399	0.4275	0.5000	0.8949	0.9234	0.9006	0.9063	0.9006
3	0.0456	0.1311	0.1026	0.5000	0.6441	0.6327	0.6327	0.6099
6	0.0285	0.0342	0.0741	0.3534	0.5000	0.5130	0.5472	0.6441
7	0.0171	0.0342	0.0969	0.3648	0.4845	0.5000	0.4959	0.5757
4	0.0228	0.0342	0.0212	0.3648	0.5016	0.5016	0.5000	0.5700
8	0.0342	0.0513	0.0969	0.3876	0.3534	0.4218	0.4275	0.5000
Total	0.5985	1.2996	1.9893	4.1838	4.7880	4.9134	4.9476	5.2098

Table 13. The "Z" matrix for the "P" matrix eliminating values of P_{ij} greater than 0.98 and less than 0.02 in Table 12

Statements	2	5	1	3	6	7	4	8
2	0.000	0.194	1.728	1.665				1.787
5	-0.228	0.000	0.176	1.108	1.787	1.787	1.787	1.607
1	-1.751	-0.181	0.000	1.254	1.426	1.287	1.317	1.287
3	-1.685	-1.122	-1.265	0.000	0.369	0.340	0.340	0.299
6		-1.825	-1.447	-0.377	0.000	0.033	0.118	0.369
7		-1.825	-1.299	0.345	-0.038	0.000	-0.010	0.194
4		-1.825	-1.335	-0.345	0.126	0.003	0.000	0.176
8	-1.825	-1.635	-1.299	-0.285	-0.377	-0.197	-0.181	0.000

Table 14. Matrix of successive differences of the column entries

Statements	5-2	Column differences 1-5	3-1	6-3	7-6	4-7	8-4
2	0.194	1.534	-0.063	0.201			-0.173
5	0.228	0.176	0.932	0.679	0.000	0.000	-0.180
1	1.570	0.181	1.254	0.172	-0.139	0.030	-0.030
3	0.563	-0.143	1.265	0.369	-0.029	0.00	-0.061
6		0.378	1.070	0.377	0.033	0.085	0.251
7		0.526	1.644	-0.383	0.038	-0.010	0.204
4		0.490	0.990	0.219	0.129	0.003	0.176
8	0.190	0.336	1.014	-0.092	0.180	0.016	0.181
(1) Sums	1.745	2.478	8.106	1.542	0.212	0.124	0.378
(2) n	5	8	8	8	7	7	8
(3) Means	0.349	0.309	1.013	0.192	0.030	0.017	0.047

Scale values

Leisure	Security	Economic	Scienticism	Freedom
S_2	S_5	S_1	S_3	S_6
0.000	0.349	0.658	1.671	1.863

Traditional	Familism	Hard work
S_7	S_4	S_8
1.893	1.910	1.957

Table 15. Zero-order correlation of coefficient: between independent and dependent variables[a]

Independent variables	Dependent variables: Adoption behavior
I. General value orientation	
1. Conservatism - liberalism	-0.7066
2. Fatalism - scienticism	-0.7435
3. Authoritarianism - non-authoritarianism	0.7373
4. Localite - cosmopolite	-0.6465
5. External conformity - individualism	0.6813
II. Occupational value orientation	
1. Hard work orientation	-0.0907
2. Familism orientation	-0.7585
3. Traditionalism orientation	-0.7956
4. Freedom orientation	0.6517
5. Scienticism orientation	0.6824
6. Economic orientation	0.8171
7. Security orientation	0.6723
8. Leisure orientation	-0.5755
III. Personal variables	
1. Education	0.0413
2. Membership	0.4742
IV. Situational variables	
1. Land size	0.0224
2. Irrigation	0.0368
3. Family size	0.0385

[a]Correlation coefficients of 0.202 or greater required for significance at .01 level.

Table 16. Actual and predicted adoption score of the basis of six variables derived through step-wise regression

(1) Cultivators	(2) Actual adoption score Y	(3) Predicted adoption score Y_p	(4) Deviation $Y - Y_p$
1	11.0000	21.0914	-10.0914
2	18.0000	13.8717	4.1283
3	16.0000	10.5789	5.4211
4	13.0000	17.1935	-4.1935
5	29.0000	27.2702	1.7298
6	16.0000	14.6971	1.3029
7	17.0000	15.0866	1.9134
8	9.0000	1.5990	7.4010
9	43.0000	41.0236	1.9764
10	25.0000	25.3421	-0.3421
11	20.0000	22.9843	-2.9843
12	14.0000	15.1011	-1.1011
13	4.0000	8.1652	-4.1652
14	26.0000	25.3566	0.6434
15	5.0000	-0.3147	5.3147
16	32.0000	32.7004	-0.7004
17	16.0000	15.9726	0.0274
18	10.0000	9.9408	0.0592
19	18.0000	15.3234	2.6766
20	25.0000	25.3566	-0.3566
21	23.0000	30.6771	-7.6771
22	5.0000	0.7012	4.2988
23	15.0000	16.5527	-1.5527
24	18.0000	14.5065	3.4935
25	11.0000	9.9408	1.0592
26	13.0000	17.1935	-4.1935
27	6.0000	3.8904	2.1096
28	7.0000	4.0749	2.9251
29	13.0000	13.3206	-0.3206
30	20.0000	27.4608	-7.4608
31	6.0000	1.5990	4.4010
32	11.0000	10.9507	0.0493
33	2.0000	-0.3147	2.3147
34	22.0000	33.3916	-11.3916
35	7.0000	0.5107	6.4893
36	9.0000	19.5841	-10.5841
37	7.0000	1.6261	5.3739
38	7.0000	9.1155	-2.1155
39	7.0000	5.5597	1.4403
40	7.0000	1.6261	5.3739

Table 16. (Continued)

(1) Cultivators	(2) Actual adoption score Y	(3) Predicted adoption score Y_p	(4) Deviation $Y - Y_p$
41	13.0000	17.0029	-4.0029
42	11.0000	10.3159	0.6841
43	10.0000	14.2885	-4.2885
44	16.0000	16.4618	-0.4618
45	11.0000	8.8643	2.1357
46	20.0000	25.8793	-5.8793
47	17.0000	20.9510	-3.9510
48	14.0000	12.1571	1.8429
49	6.0000	-0.3147	6.3147
50	2.0000	0.8008	1.1992
51	21.0000	28.6327	-7.6327
52	18.0000	16.5527	1.4473
53	9.0000	3.2768	5.7232
54	11.0000	10.3244	0.6756
55	7.0000	1.3360	5.6640
56	18.0000	18.9166	-8.5458
57	20.0000	28.5458	-8.5458
58	15.0000	14.7115	0.2885
59	16.0000	20.5587	-4.5587
60	10.0000	11.8481	-1.8481
61	12.0000	20.6668	-8.6668
62	9.0000	4.2926	4.7074
63	16.0000	18.2094	-2.2094
64	11.0000	10.2123	0.7877
65	11.0000	11.7820	-0.7820
66	10.0000	12.4228	-2.4228
67	10.0000	10.7806	-0.7806
68	7.0000	-0.3147	7.3147
69	7.0000	6.0429	0.9571
70	9.0000	7.1497	1.8503
71	12.0000	15.1618	-3.1618
72	3.0000	3.5398	-0.5398
73	7.0000	2.9781	4.0219
74	11.0000	12.2567	-1.2567
75	3.0000	-0.3147	3.3147
76	11.0000	10.3159	0.6841
77	12.0000	13.6957	-1.6957
78	7.0000	2.4243	4.5757
79	7.0000	4.1021	2.8979
80	10.0000	21.0005	-11.0005

Table 16. (Continued)

(1) Cultivators	(2) Actual adoption score Y	(3) Predicted adoption score Y_p	(4) Deviation $Y - Y_p$
81	7.0000	3.6579	3.3421
82	9.0000	5.7316	3.2684
83	17.0000	21.4837	-4.4837
84	84.0000	48.0857	35.9143
85	64.0000	45.0753	18.9247
86	17.0000	21.8343	-4.8343
87	14.0000	18.6596	-4.6596
88	16.0000	15.9871	0.0129
89	10.0000	7.2221	2.7779
90	72.0000	45.1562	26.8438
91	26.0000	29.1865	-3.1865
92	27.0000	26.8227	0.1773
93	16.0000	15.0782	0.9218
94	20.0000	27.9137	-7.9137
95	11.0000	11.6449	-0.6449
96	18.0000	16.5527	1.4473
97	11.0000	18.8483	-7.8483
98	35.0000	39.1100	-4.1100
99	32.0000	36.4579	-4.4579
100	34.0000	36.1778	-2.1778
101	39.0000	37.4678	1.5322
102	30.0000	28.6654	1.3346
103	51.0000	44.3309	6.6691
104	31.0000	32.2384	-1.2384
105	33.0000	35.7302	-2.7302
106	25.0000	23.8676	1.1324
107	27.0000	28.6554	-1.6554
108	28.0000	27.0217	0.9783
109	27.0000	25.0769	1.9231
110	9.0000	10.8323	-1.8323
111	26.0000	25.6281	0.3719
112	23.0000	32.4102	-9.4102
113	36.0000	37.9068	-1.9068
114	21.0000	23.7144	-2.7144
115	33.0000	32.0921	0.9079
116	15.0000	14.2613	0.7387
117	29.0000	30.1300	-1.1300
118	9.0000	5.5715	3.4285
119	11.0000	17.2079	-6.2079
120	29.0000	32.4102	-3.4102

Table 16. (Continued)

(1) Cultivators	(2) Actual adoption score Y	(3) Predicted adoption score Y_p	(4) Deviation $Y - Y_p$
121	10.0000	10.6417	-0.6417
122	10.0000	9.6131	0.3869
123	14.0000	16.7789	-2.7789
124	7.0000	2.5424	4.4576
125	8.0000	4.2926	3.7074
126	6.0000	7.2221	-1.2221
127	27.0000	35.9772	-8.9772
128	30.0000	39.1100	-9.1100
129	16.0000	16.1631	-0.1631
130	60.0000	47.6297	12.3703
131	3.0000	-0.3147	3.3147
132	3.0000	8.1384	-5.1384
133	18.0000	14.1459	3.8541
134	3.0000	0.8008	2.1992
135	23.0000	25.1720	-2.1720
136	22.0000	22.6901	-0.6901
137	36.0000	35.6266	0.3734
138	33.0000	34.6167	-1.6167
139	25.0000	27.2038	-2.2038
140	23.0000	23.4969	-0.4969
141	29.0000	30.9553	-1.9553
142	27.0000	29.5616	-2.5616
143	21.0000	25.1720	-4.1720
144	69.0000	44.7811	24.2189
145	64.0000	40.2067	23.7933
146	27.0000	37.9945	-10.9945
147	14.0000	18.3794	-4.3794
148	10.0000	14.2885	-4.2885
149	26.0000	27.7120	-1.7120
150	11.0000	20.2351	-9.2351
151	12.0000	7.8484	4.1516
152	14.0000	15.3378	-1.3378
153	14.0000	13.6957	0.3043
154	5.0000	9.0633	-4.0633
155	2.0000	2.6148	-0.6148
156	43.0000	31.4340	11.5660
157	13.0000	24.0071	-11.0071
158	9.0000	7.1497	1.8503
159	10.0000	10.7721	-0.7721
160	28.0000	24.5027	3.4973

Table 16. (Continued)

(1) Cultivators	(2) Actual adoption score Y	(3) Predicted adoption score Y_p	(4) Deviation $Y - Y_p$
161	39.0000	34.8737	4.1263
162	29.0000	30.9526	-1.9526
163	29.0000	35.4089	-6.4089
164	7.0000	16.0216	-9.0216
165	12.0000	10.5934	1.4066
166	12.0000	16.2626	-4.2626
167	12.0000	14.0852	-2.0852
168	12.0000	15.2527	-3.2527
169	12.0000	14.8236	-2.8236
170	7.0000	4.3379	2.6621
171	4.0000	3.7575	0.2425
172	4.0000	4.5828	-0.5828
173	7.0000	5.0968	1.9032
174	7.0000	4.4832	2.5168
175	20.0000	31.4780	-11.4780

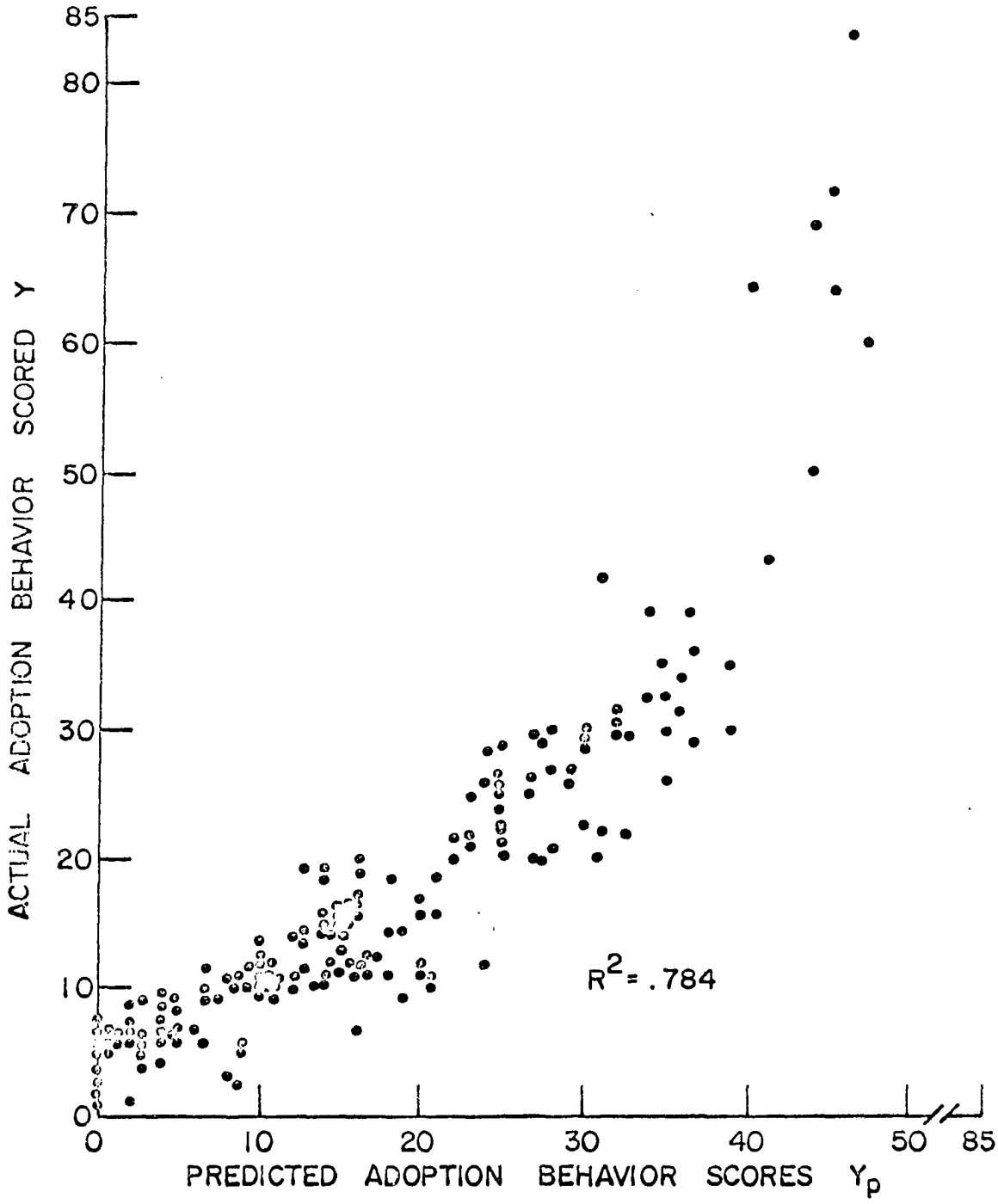

Figure 6. Scatter diagram: actual and predicted adoption behavior scores (6 independent variables and n = 175 cultivators)

APPENDIX B

Scales Used in Study

A Sample Proforma for the Calculation of AQ

Name of Cultivator: Ragunath Name of Village: Auchandi

	Improved wheat seed			Fertilizers			Soil inverting plough			Olpad thresher			Weedicide		
Years	e	p	e/p	e	p	e/p	e	p	e/p	e	p	e/p	e	p	e/p
1958-59	5	10	0.5	10	15	.70	15	15	1	10	10	1	-	-	-
1959-60	5	10	0.5	10	15	.70	15	15	1	10	10	1	-	-	-
1960-61	5	10	0.5	15	15	1.00	15	15	1	10	10	1	-	-	-
1961-62	5	10	0.5	10	15	.70	15	15	1	10	10	1	-	-	-
1962-63	5	10	0.5	15	15	1.00	15	15	1	10	10	1	1.25	10	0.125
$t_p - t_1$ $\sum_i e_j/p_j$			2.5			3.10			5			5			0.125
$t_p - t_1$			5			5			5			5			5
Y_j			.50			.62			1			1			.025
W_j			1			2			3			4			5
$Y_j W_j$			.50			1.24			3			4			.125

$\sum_{j=1}^{Y_j W_j} (Y_j W_j) = 8.9$ $AQ = \frac{8.9}{15} \times 100 = 59.33 = 59$

The Items or Statements of Five Dimensions of the General Value Orientation Scale[1]

1. "Mantras" have far-reaching effects. If one can chant and recite accurately right "Mantras" on right occasion, he can produce miraculous effects.
2. If one believes in anything as truly good, he is justified if he ruthlessly imposes it on others.
3. The good old days were golden.
4. The caste system has more virtues than vices.
5. One should not have any faith in meetings, committees or corporate bodies; since there the members indulge in wranglings only and no effective work is ever done.
6. All kinship relations should be maintained as they have been so far.
7. Every event in a man's life has already been settled and determined by his fate.
8. The present pattern of education is better than the former.
9. People should be forced to contribute to National Defense Fund.
10. It is better to disbelieve in what is not proved or tested; but when proved it is to be relied on.
11. A basic human tragedy is that man proposes - but God disposes.
12. It is better to rule in Hell than to serve in Heaven.

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[1]The items pertaining to the three scales: C-L, F-S, and A-N were developed by Chattopadhya (16), the remaining items for two scales: Lo-Co and E-I were developed by the author.

13. Marriage within one's own caste should not be strictly pursued; inter-caste marriage should be favored.
14. The judgement of a tribunal of judges is better than that of a single judge.
15. Those who say that they have seen ghosts, either distort the truth or tell a lie.
16. A man can learn many things from the happenings and experience of his village only.
17. A person who has seen something worked in his village, need not worry about taking any additional information from sources outside his village.
18. Many things a person ought to know is happening outside of his village and such happenings may be of great advantage to a person. He, therefore, ought to know.
19. One person's experience is not as better as collective experience of a group of persons.
20. One can satisfy all his requirements out of the local resources available to him.
21. A person can save himself with many indecisions and difficulties of life, if he believes in taking and following the advice of his friends, relatives, neighbors etc.
22. A person, who does not believe in consulting others, can do a better job.
23. It is a sign of weakness and impotency when a person relies on others opinions for making his decisions.

24. At present when the transport and communication facilities are developing, a villager should know more about things happening outside his village.
25. Action should be undertaken only after consulting others.

The following is a description of the distribution of each of the items in terms of five scales.

1. The conservatism - liberalism (C-L) scale consisted of items 3, 4, 6, 8, and 13.
2. The fatalism - scienticism (F-S) scale consisted of items 1, 7, 10, 11, and 15.
3. The authoritarianism - non-authoritarianism (A-N) scale consisted of items 2, 5, 9, 12, and 14.
4. The localite - cosmopolite (Lo-Co) scale consisted of items 16, 17, 18, 20, and 24.
5. The external conformity - individualism (E-I) scale consisted of items 19, 21, 22, 23, and 25.

Proforma for Paired Comparison Technique on Occupational Value

1. Name of the village
2. Name of the cultivator
3. Caste
4. Education
5. Total land
6. Irrigated
7. Un-irrigated
8. Total number of family members
9. Male
10. Female
11. Children
12. Member of local body

Card number	Combinations		Combinations	
1	1	2	1	2
2	3	4	3	4
3	5	6	5	6
4	7	8	7	8
5	2	3	2	3
6	4	5	4	5
7	6	7	6	7
8	8	3	8	3
9	1	4	1	4
10	2	5	2	5

Card number	Combinations		Combinations	
11	3	7	3	7
12	4	6	4	6
13	5	8	5	8
14	6	1	6	1
15	7	2	7	2
16	8	4	8	4
17	1	3	1	3
18	2	8	2	8
19	3	6	3	6
20	4	7	4	7
21	5	1	5	1
22	6	2	6	2
23	7	5	7	5
24	8	1	8	1
25	1	7	1	7
26	2	4	2	4
27	3	5	3	5
28	6	8	6	8

Card No.	Statement
1	In this occupation (farming) investment is less and we get more
	This occupation (farming) is handed down from generation to generation
2	In this occupation (farming) less work, more free time
	In this occupation (farming) opportunity to live with family
3	In this occupation (farming) more opportunity to try out innovation
	In this occupation (farming) there is less risk
4	In this occupation (farming) there is less risk
	In this occupation (farming) investment is less and we get more
5	In this occupation (farming) there is freedom to work
	In this occupation (farming) opportunity to do hard work
6	In this occupation (farming) there is freedom to work
	In this occupation (farming) less work, more free time
7	This occupation (farming) is handed down from generation to generation
	In this occupation (farming) opportunity to do hard work
8	In this occupation (farming) more opportunity to try out innovations
	In this occupation (farming) opportunity to live with family

Card No.	Statement
9	In this occupation (farming) investment is less and we get more
	In this occupation (farming) less work, more free time
10	In this occupation (farming) there is less risk
	In this occupation (farming) there is freedom to do work
11	In this occupation (farming) opportunity to do hard work
	In this occupation (farming) more opportunity to try out innovations
12	In this occupation (farming) there is freedom to work
	This occupation (farming) is handed down from generation to generation
13	In this occupation (farming) opportunity to live with family
	In this occupation (farming) there is less risk
14	In this occupation (farming) less work, more free time
	In this occupation (farming) more opportunity to try out innovations
15	In this occupation (farming) opportunity to do hard work
	In this occupation (farming) investment is less and we get more
16	This occupation (farming) is handed down from generation to generation
	In this occupation (farming) there is less risk

Card No.	Statement
17	In this occupation (farming) more opportunity to try out innovations
	This occupation (farming) is handed down from generation to generation
18	In this occupation (farming) opportunity to do hard work
	In this occupation (farming) there is less risk
19	In this occupation (farming) investment is less and we get more
	In this occupation (farming) opportunity to live with family
20	In this occupation (farming) opportunity to live with family
	This occupation (farming) is handed down from generation to generation
21	In this occupation (farming) more opportunity to try out innovations
	In this occupation (farming) there is freedom to do work
22	In this occupation (farming) less work, more free time
	In this occupation (farming) opportunity to do hard work
23	In this occupation (farming) investment is less and we get more
	In this occupation (farming) more opportunity to try out innovations

Card No.	Statement
24	In this occupation (farming) opportunity to do hard work
	In this occupation (farming) opportunity to live with family
25	This occupation (farming) is handed down from generation to generation
	In this occupation (farming) less work, more free time
26	In this occupation (farming) there is freedom to do work
	In this occupation (farming) investment is less and we get more
27	In this occupation (farming) there is less risk
	In this occupation (farming) opportunity to do hard work
28	In this occupation (farming) opportunity to live with family
	In this occupation (farming) there is freedom to do work